United States Patent

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[54] **BRIDGE SCAFFOLD**
3 Claims, 9 Drawing Figs.

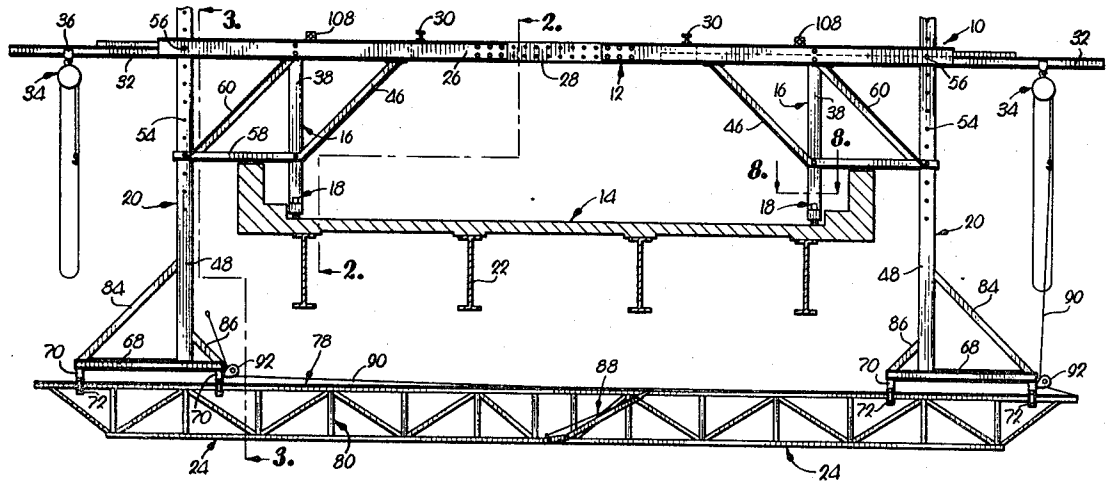
[52] **U.S. Cl.** **182/36,** 182/63, 182/150
[51] **Int. Cl.** **E04g 3/14**
[50] **Field of Search** 182/63, 36, 37, 150, 141

[56] **References Cited**
UNITED STATES PATENTS

2,639,950	5/1953	Wheeler	182/37
3,035,659	5/1962	Sims	182/63
3,076,522	2/1963	Goodell	182/36
3,282,377	11/1966	Pfeiffer	182/36
3,394,776	7/1968	Abrams	182/150

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ABSTRACT: A mobile bridge scaffold comprising an elongated frame spanning a bridge transversely thereacross, a standard carried by the frame at each end thereof and depending therefrom in outwardly spaced relationship from the sides of the bridge, and elongated platforms shiftably carried by the lowermost ends of each standard for movement from cantilevered positions projecting toward the other platform beneath the bridge to provide a support for workmen, to alternate cantilevered positions projecting outwardly away from the bridge to provide clearance to permit movement of the scaffold longitudinally of the bridge.



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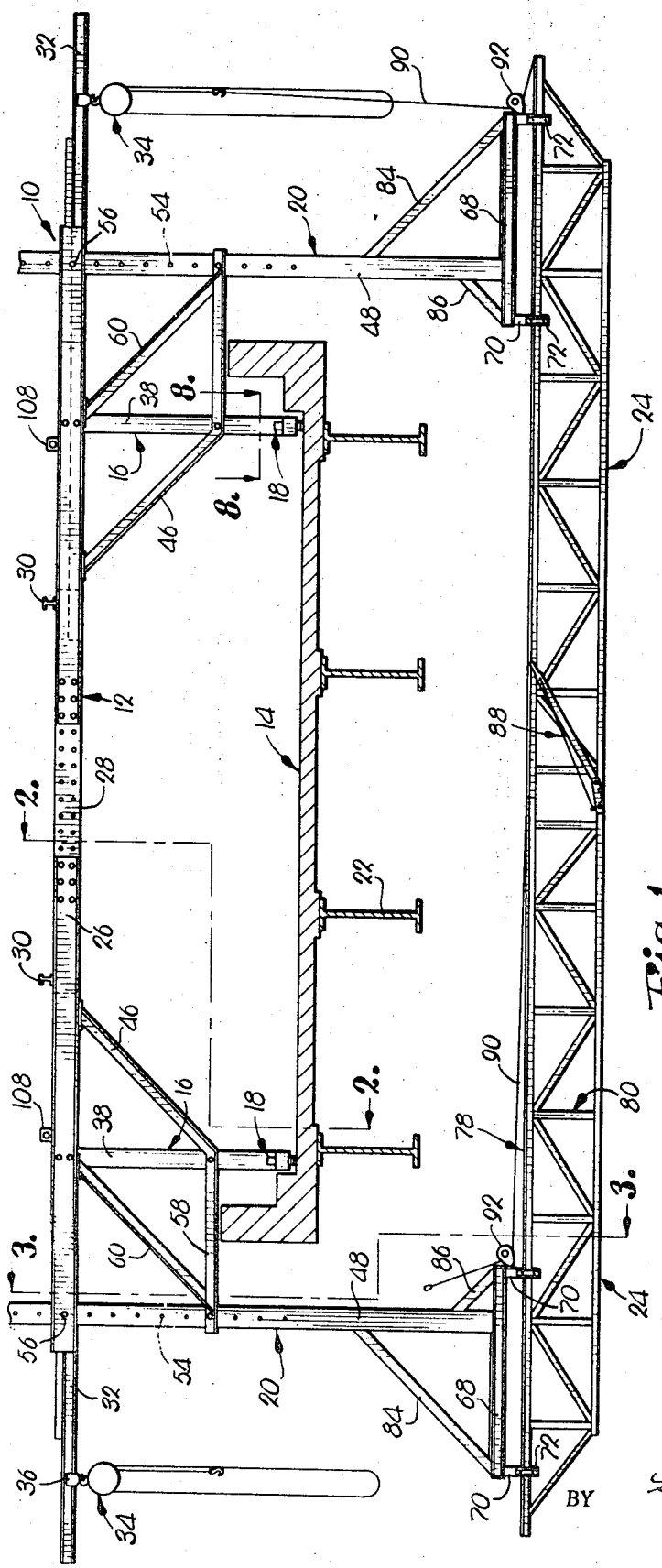


Fig. 1.

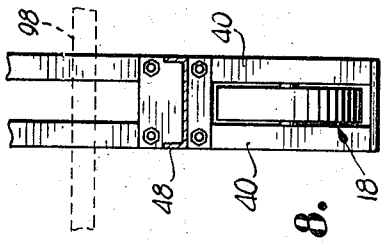


Fig. 8.

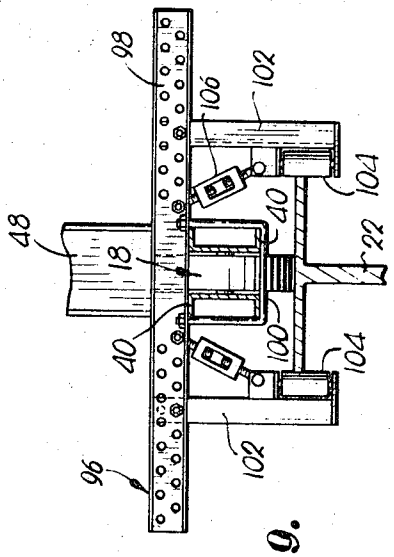


Fig. 9.

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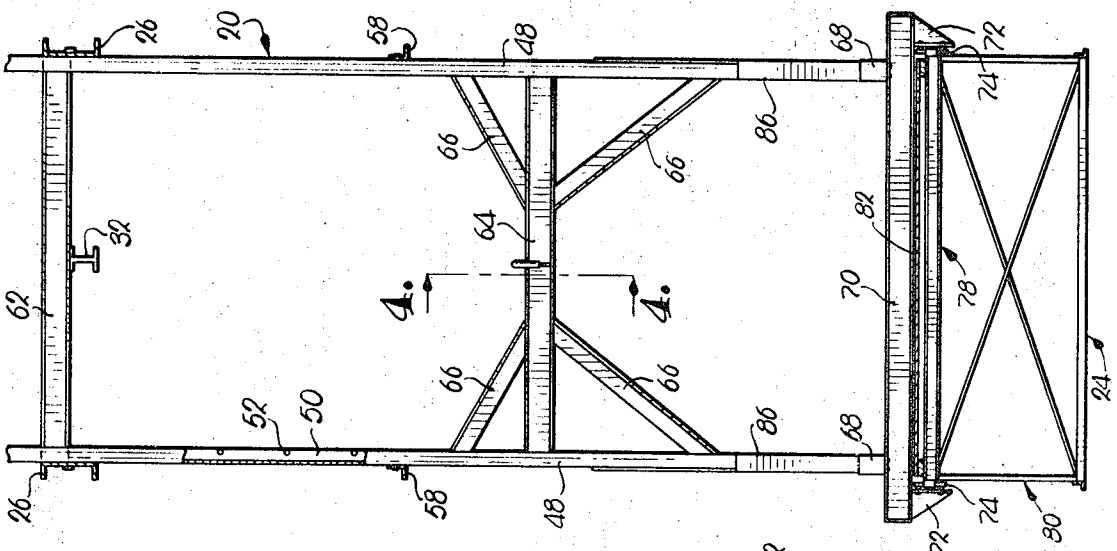


Fig.3.

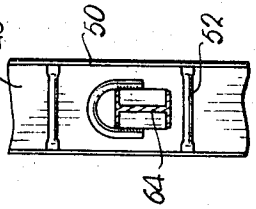


Fig.4.

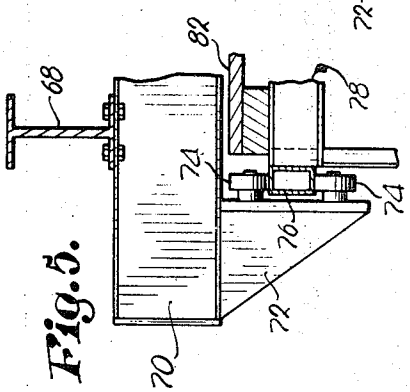


Fig.5.

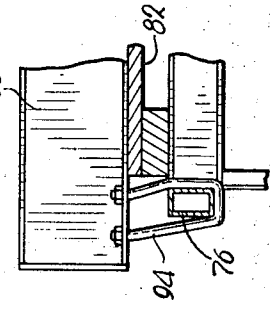


Fig.7.

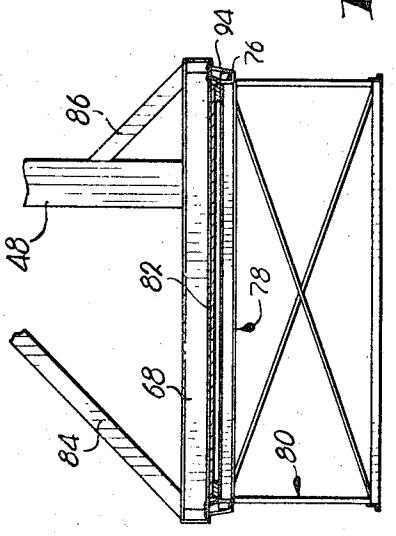


Fig.6.

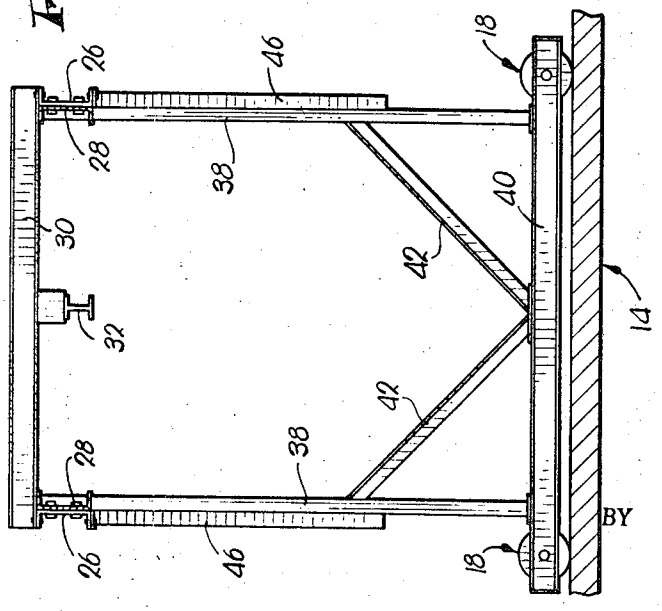


Fig.2.

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BRIDGE SCAFFOLD

This invention relates to scaffolds and, more particularly, to a movable scaffold or buggy to support workmen requiring access to the bridge, as, for example, during construction thereof. It is common practice to form bridge decks, fascia and the like from concrete which is poured into forms supported by the bridge girders. The forms and associated hardware are later stripped from the cured concrete.

The piers which support the girders have heretofore presented an obstacle to the longitudinal movement of scaffolding along the bridge, thereby rendering the construction of scaffolds for placement and removal of the bridge forms a relatively slow, expensive operation.

It is, therefore, a primary object of this invention to provide a mobile scaffold which affords reasonable access around the bridge girders, yet which may be readily moved longitudinally of the bridge.

Another important object of the invention is to provide novel, cantilevered workman-supporting platforms which may be quickly and easily shifted to positions clearing the girder supports to permit movement of the scaffold longitudinally along the bridge.

Still another object of the present invention is the provision of platform support structure wherein the platforms may be turned longitudinally of the bridge to permit access to relatively long stretches of the bridge without need for moving the scaffold frame longitudinally of the bridge.

A further object of the invention is to provide a novel scaffold which may be quickly and easily adjusted to accommodate structures of various sizes.

A yet further object of the invention is to provide an easily transportable, highly versatile scaffold having auxiliary hoist means for lifting material and for shifting the scaffold components into proper position for movement from one position to another.

These and other objects of the invention will be further explained or will become apparent from the description, claims and drawings.

In the drawings:

FIG. 1 is a fragmentary, side elevational view on a reduced scale of a scaffold embodying the principles of this invention, a bridge being shown in vertical cross section;

FIG. 2 is a detailed cross-sectional view taken along irregular line 2–2 of FIG. 1;

FIG. 3 is a detailed cross-sectional view taken along irregular line 3–3 of FIG. 1;

FIG. 4 is a fragmentary, detailed cross-sectional view taken along line 4–4 of FIG. 3;

FIG. 5 is an enlarged, fragmentary, detailed vertical cross-sectional view through one of the workman-supporting platforms and corresponding standard showing the connection of the rollers with the platform rail;

FIG. 6 is a fragmentary, side elevational view of one standard showing a platform supported thereby in an alternate position extending longitudinally of the bridge;

FIG. 7 is an enlarged, fragmentary, detailed cross-sectional view through the platform of FIG. 6 and illustrating the connectors used to support the platform in said alternate position;

FIG. 8 is a detailed, cross-sectional view taken along line 8–8 of FIG. 1, the position of an optional beam rider bracket appearing fragmentarily in dash lines; and

FIG. 9 is an enlarged, fragmentary, vertical cross-sectional view through a leg of the scaffold frame illustrating the optional beam rider attachment.

Apparatus embodying the principles of this invention is broadly designated by the reference numeral **10** and includes an elongated, rigid frame **12** extending transversely across a bridge **14** with the opposed ends of frame **12** projecting outwardly from the sides of the bridge. Support means **16** including wheel and axle assemblies **18** are disposed in spaced relationship intermediate the ends of frame **12** and are adapted to support the latter in vertically spaced relationship above the upper surface of the bridge.

A pair of depending standards **20** are secured at respective ends of frame **12** as illustrated best in FIG. 1. The standards **20** extend downwardly in outwardly spaced relationship from the sides of the bridge and project substantially below the bridge girders **22**. Each standard **20** carries an elongated platform **24** adapted to support workmen to provide them with access to bridge **14** as will be hereinafter explained.

Frame **12** includes a pair of parallel, horizontally spaced channel members **26** extending transversely of bridge **14**. As illustrated in FIG. 1, each member **26** may comprise two or more longitudinally aligned sections interconnected by a coupler **28** so that the length of the members **26** may be selectively varied to accommodate bridges of differing widths.

The spaced channel members **26** are rigidly interconnected with transversely extending, rigid beams **30** disposed at spaced intervals along frame **12**. A beam **32** is disposed in parallel relationship with channel members **26** intermediate the latter to provide a trolley rail for a hoist **34** having a trolley **36** engaged on beam **32** for shifting movement therealong. Manifestly, beam **32** is carried by crossbeams **30** and beam **32** projects outwardly beyond the ends of frame **12** for a substantial distance as shown clearly in FIG. 1.

The support means **16** comprises a pair of vertically extending legs **38** interconnected at their lowermost ends with a beam **40** disposed to extend generally longitudinally of bridge **14**. Wheel and axle assemblies **18** are mounted at opposite ends of beam **40** and the support means is stabilized by diagonally extending braces **42** connecting beam **40** with legs **38** as shown in FIG. 2. The uppermost ends of legs **38** are connected in back-to-back relationship to the corresponding members **26**. The members **44** are thus in a position to carry crossbeams **30** for supporting the weight of frame **12**. Diagonal braces **46** connect legs **38** with members **26** to stabilize support means **16** in the direction of alignment of members **26**.

Each standard **20** includes a pair of parallel, spaced-apart channel members **48** as is perhaps best illustrated in FIG. 3. The spaced, parallel flanges **50** of members **48** extend toward the corresponding flanges of the opposite member **48**, and the flanges **50** carry parallel, vertically spaced, rigid members **52** to present ladder means extending the lengths of the members **48**. Manifestly, either one or both of the members **48** for each standard **20** can be provided with members **52** to provide ladder means. Members **48** are also provided with a series of vertically spaced holes **54** as shown in FIG. 1. The holes **54** cooperate with pin means **56** carried by the members **26** to permit vertical adjustment of the standard **20** as may be desired to accommodate the particular bridge with which apparatus **10** is used. Braces **58** and **60** interconnect members **48** of standards **20** with corresponding legs **38** of support means **16** (FIG. 1) whereby the standards are maintained in substantially upright position at all times.

A top member **62** and an intermediate member **64** interconnect the upright members **48** of each standard **20**. Angle braces **66** secured to member **64** and members **48** serve to rigidify each standard **20**. The lowermost end of each standard is connected to a beam **68** which extends generally transversely of bridge **14** in general longitudinal alignment with frame **12**. The beams **68** for each member **48** are, in turn, interconnected by transversely extending beams **70**. It will be understood that there is a beam **70** disposed at each end of each pair of beams **68**. The beams **70** project outwardly beyond the respective members **48** and each end has secured thereto a depending bracket **72**. Spaced-apart rollers **74** (FIGS. 3 and 5) carried by the respective brackets **72** receive therebetween rectangular box members **76** disposed alongside each longitudinal, uppermost edge of the corresponding platforms **24**. The latter comprise elongated, rigid trusses having an uppermost frame **78** and interconnecting supporting trusswork **80** as illustrated clearly in the drawings. A deck **82** which may be constructed from plywood or the like is supported on frame **78** to provide a supporting surface for workmen requiring access to the bridge.

Referring particularly to FIG. 1, it may be seen that each standard 20 is secured to its respective beam 68 in closer proximity to one end of the beam than the other. Diagonal braces 84 and 86 connect the ends of beams 68 to their respective members 48 for stabilizing the standards.

The rectangular, tubular box members 76 carried by platform 24 provide a rail shiftable between the sets of rollers 74 to permit longitudinal shifting of the platforms 24 from the position thereof illustrated in FIG. 1 to positions with the platforms extending outwardly completely beyond the outermost edges of bridge 14 to permit longitudinal movement of apparatus 10 along the bridge without the platforms 24 interfering with supporting bridge structure (not shown). It is to be noted that the standards 20 carry the platforms 24 in cantilevered relationship irrespective of whether or not the platforms are in the positions shown or in the positions projecting outwardly for clearing the bridge support structure.

The platforms 24, when in the positions thereof illustrated in FIG. 1, may be releasably interconnected by a lock 88. Any suitable lock may be utilized for this purpose and it is not deemed necessary to describe lock 88 in greater detail.

There is preferably a hoist 34 for each end of I-beam 32. When it is desired to move a platform 24 to its outwardly projecting position, an elongated, flexible element 90, such as a cable or the like, is secured to the inwardly projecting end of the platform, is threaded through pulley means 92 on standard 20, and is engaged with the hoist means 34. A workman operating the hoist can quickly and easily shift the platform 24 to the outwardly projecting position to permit longitudinal movement of apparatus 10.

Conversely, when it is desired to move the platforms to the workman-supporting position to provide the workman with access to the bridge 14 transversely of the latter, the element 90 is secured to the outermost projecting end of platform 24. Pulley means 92 may be repositioned to the outermost side of the standard 20 whereupon pulling of the element 90 by hoist 34 shifts the rails and, therefore, the platform, along rollers 74, to the position thereof illustrated in FIG. 1. The platforms 24 are then secured together by latch means 88 whereupon the workman may move along deck 82 as may be required for performing necessary operations in and around bridge 14.

Hoists 34, when not utilized for shifting platforms 24, may be used to move material toward and away from the deck 82. Accordingly, apparatus 10 is particularly useful as a stripping buggy for removal or placement of concrete forms used in the construction of the fascia and roadway of the bridge. It will be readily recognized that pulley means 92 for each position relative to standard 20 illustrated in FIG. 1 may be secured to the standard at all times to obviate the necessity for changing the positions of the pulley means.

When it is desired to utilize apparatus 10 for supporting workmen alongside the bridge 14 rather than beneath the latter, the standards 20 may be utilized for carrying the platforms 24 in positions extending longitudinally of the bridge. For such operations, the beams 70 and brackets 72 are removed from the standards. The platforms 24 are rotated 90° with respect to the positions illustrated in FIGS. 1, 3 and 5. U-shaped bolts 94 are then utilized to secure rails 76 directly to beams 68 as is illustrated in FIGS. 6 and 7. It will be appreciated that workmen may then walk along deck 82 and the apparatus 10 can be moved longitudinally of the bridge to permit workmen access to relatively long stretches of the bridge.

The positional relationship of the members 48 with respect to the beams 68 permit the supporting of the platforms 24 in greater proximity to the edges of bridge 14 than that illustrated in the drawing simply by reversing the direction in which the standards 20 face. In other words, if the standards 20 are turned around, the longest portion of beam 68 projecting from members 48 is directed inwardly toward the bridge. This, in turn, moves the position of support of the platforms 24 inwardly. The workmen are thus moved closer to the bridge when such disposition for the workmen is desired.

Although apparatus 10 is particularly useful for removing forms used in constructing bridge 14, it can be used in placing the forms and for other operations prior to pouring of the concrete. To this end, it is but necessary to augment the wheel and axle assemblies 18 with beam rider structure broadly designated 96 illustrated particularly in FIG. 9. Structure 96 includes a beam 98 adapted to be releasably secured to the beams 40 which mount the assemblies 18. To this end, one or more U-bolts 100 releasably clamp beam 98 to beams 40 as illustrated in FIG. 9.

Depending legs 102 have their uppermost ends secured at spaced-apart intervals along beam 98, and a roller 104 is mounted on each leg 102 for rotation about vertical axes. Diagonally extending turnbuckle means 106 may be secured to legs 102 and beam 98 to stabilize the assembly. The spacing between rollers 104 is such that the rollers engage the outermost longitudinal edges of the uppermost flange of a corresponding bridge girder 22. The wheel and axle assembly 18 is supported by the flange of girder 22 so that apparatus 10 is supported by the girders and may be moved longitudinally thereof without necessity for the roadway and without danger of the frame 12 falling from its supporting girders.

Apparatus 10 is particularly well suited for easy transportability from one bridge construction site to another. To transport apparatus 10, the platforms 24 are shifted outwardly to the positions thereof as if the apparatus 10 were to be moved around a bridge-supporting pier. A crane on bridge 14 is then secured to apparatus 10 by means of pickup eyes 108 (FIG. 1) on member 26. The crane lifts the entire apparatus 10 until the platforms 24 will clear the top of bridge deck 14. The crane then rotates the entire apparatus approximately 90° and brings it to a position over the top of deck 14. Platforms 24 are then shifted inwardly to their closed positions whereupon lock 88 is secured. The crane then sets the entire apparatus down upon a vehicle such as a low-boy or the like. Attachment of members 26 and 58 to members 48 is then released to permit the crane to lower the upper portion of the structure down until wheel trucks 18 engage the decks 82.

When properly positioned for transport, the wheel and axle assemblies 18 will rest upon the deck 82 of each platform. The upwardly extending members of each standard 20 may be constructed in sections so that the vertical height of the apparatus 10 may be minimized to enhance transportability.

We claim:

1. A mobile scaffold for supporting workmen adjacent a bridge, said scaffold comprising:

a frame adapted to extend transversely across said bridge, the frame including support means adapted to engage the bridge and to permit movement of the frame longitudinally of the bridge;

a standard for each end of the frame respectively, each standard being carried by the frame and extending downwardly therefrom, the standards being adapted to extend downwardly below the girders of said bridge and in outwardly spaced relationship from the corresponding sides of the bridges;

an elongated platform for each standard respectively; means mounting each platform to its corresponding standard for movement between a first position projecting inwardly beneath the bridge girders and toward the other platform, to a second position disposed outwardly from the corresponding edges of the bridge to permit movement of the scaffold longitudinally of the latter; and a trolley extending longitudinally of the frame, and hoist means carried by the trolley for movement therealong to any selected lifting position.

2. A mobile scaffold for supporting workmen adjacent a bridge, said scaffold comprising:

a frame adapted to extend transversely across said bridge, the frame including support means adapted to engage the bridge and to permit movement of the frame longitudinally of the bridge;

a standard for each end of the frame respectively, each standard being carried by the frame and extending downwardly therefrom, the standards being adapted to extend downwardly below the girders of said bridge and in outwardly spaced relationship from the corresponding sides of the bridge;

an elongated platform for each standard respectively;

means mounting each platform to its corresponding standard for movement between a first position projecting inwardly beneath the bridge girders and toward the other platform, to a second position disposed outwardly from the corresponding edges of the bridge to permit movement of the scaffold longitudinally of the latter; and

said mounting means including a pair of rollers carried by the standard and a rail carried by the platform, said rollers being engageable with the rail to carry the weight of the platform and to facilitate manual shifting of the platform between said first and second positions, said rail extending longitudinally of the platform and the rollers being disposed to engage the rail intermediate the ends of the platform, and wherein is included pulley means secured to the standard proximal the lowermost end thereof, and a flexible element having one end thereof secured to one end of the platform and extending through the pulley means whereby to shift the platform along the rollers when a pulling force is exerted on the other end of the element.

3. A mobile scaffold for supporting workmen adjacent a bridge, said scaffold comprising:

a frame adapted to extend transversely across said bridge, the frame including support means adapted to engage the bridge and to permit movement of the frame longitudinally of the bridge;

a standard for each end of the frame respectively, each standard being carried by the frame and extending downwardly therefrom, the standards being adapted to extend downwardly below the girders of said bridge and in outwardly spaced relationship from the corresponding sides of the bridge;

an elongated platform for each standard respectively;

means mounting each platform to its corresponding standard for movement between a first position projecting inwardly beneath the bridge girders and toward the other platform, to a second position disposed outwardly from the corresponding edges of the bridge to permit movement of the scaffold longitudinally of the latter;

said mounting means including a pair of rollers carried by the standard and a rail carried by the platform, said roller means being engageable with the rail to carry the weight of the platform and to facilitate manual shifting of the platform between said first and second positions,

the standard including an upright, a crossmember secured to the lowermost end of the upright at a point along the crossmember closer to one end than the other end thereof, one of said rollers being carried at each end of said crossmember respectively; and

means releasably mounting the upright to the standard with either of said ends of the crossmember projecting toward the other standard, the relative position of said platforms with respect to the sides of the bridge being varied in accordance with which of said ends of the crossmember is projecting toward the other standard.