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TRAVELING SCAFFOLD FOR BRIDGES AND THE LIKE

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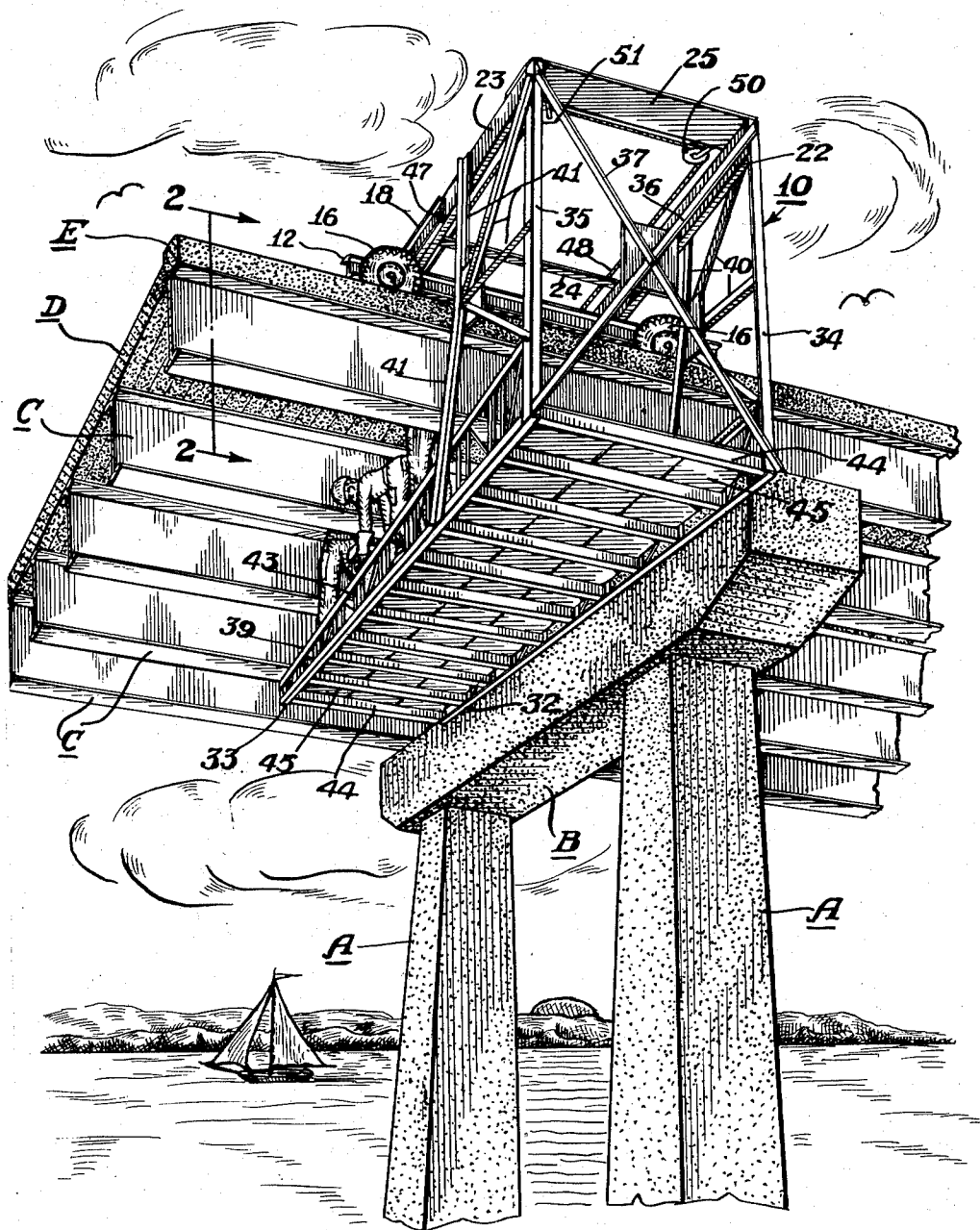


Fig. 1.

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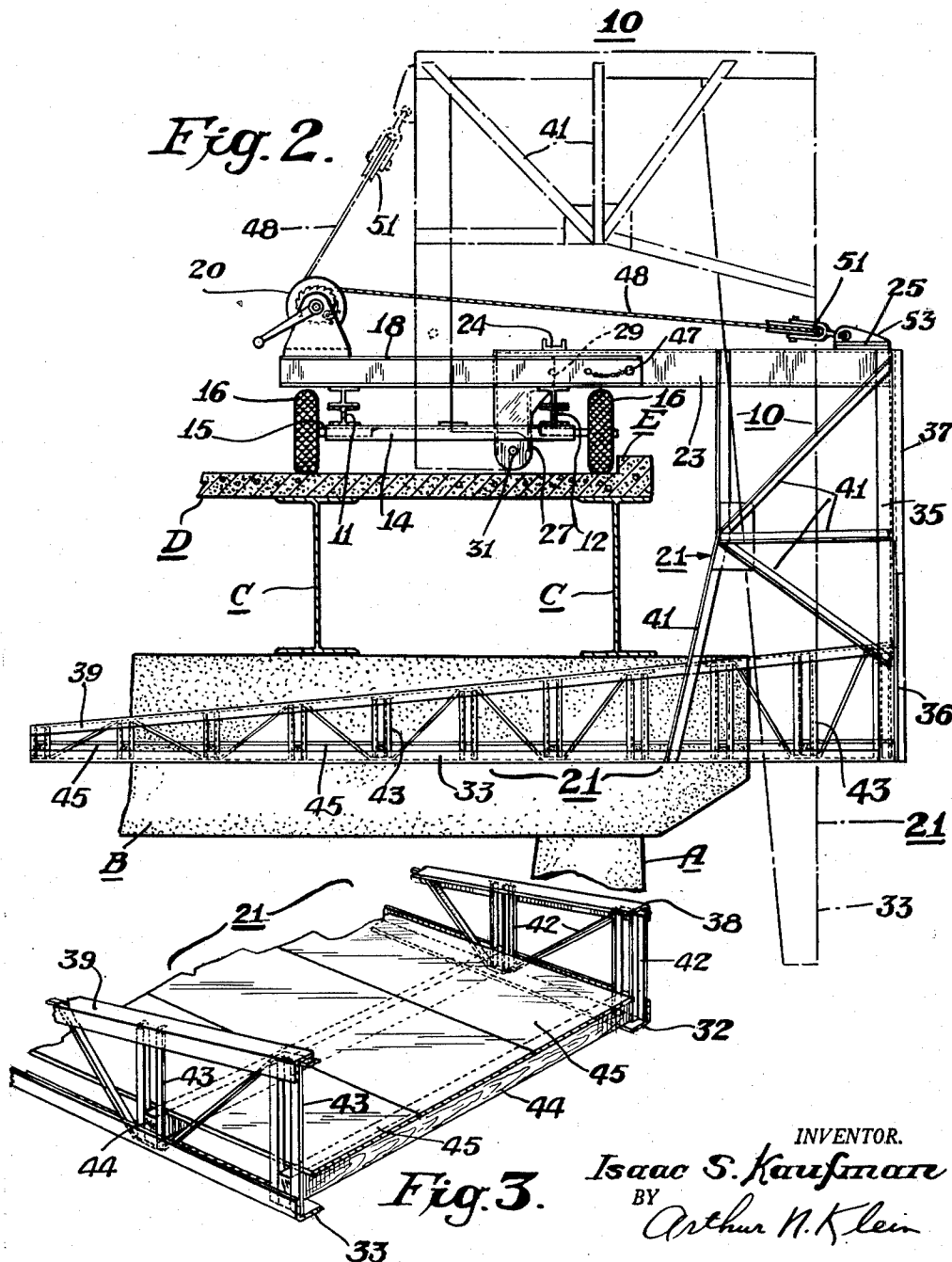
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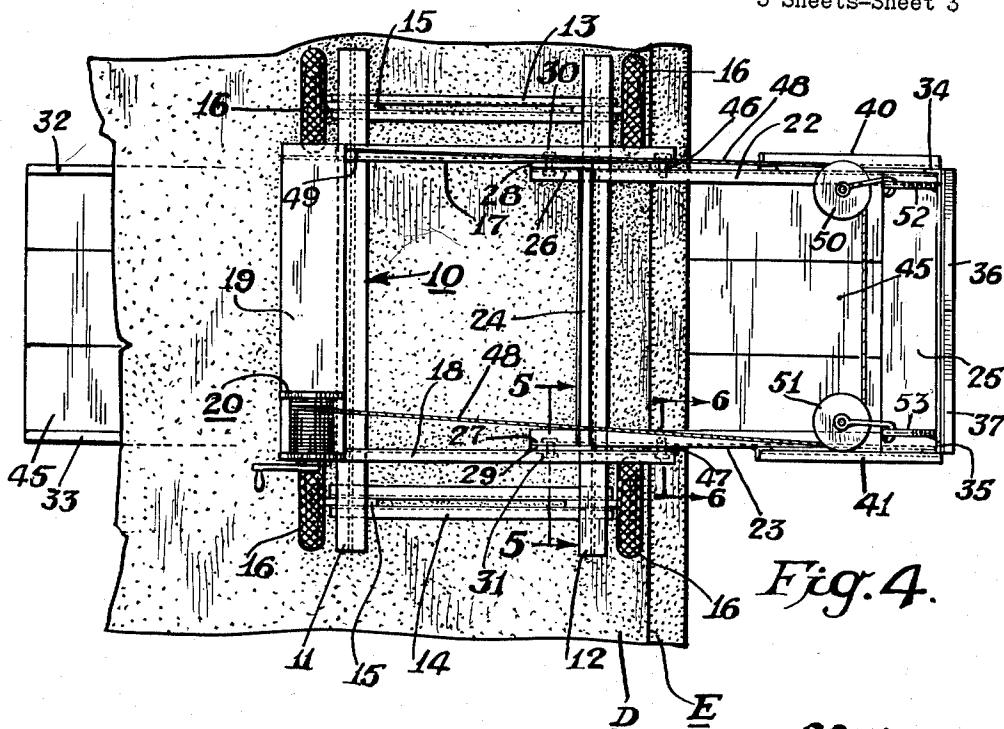


Fig. 4.

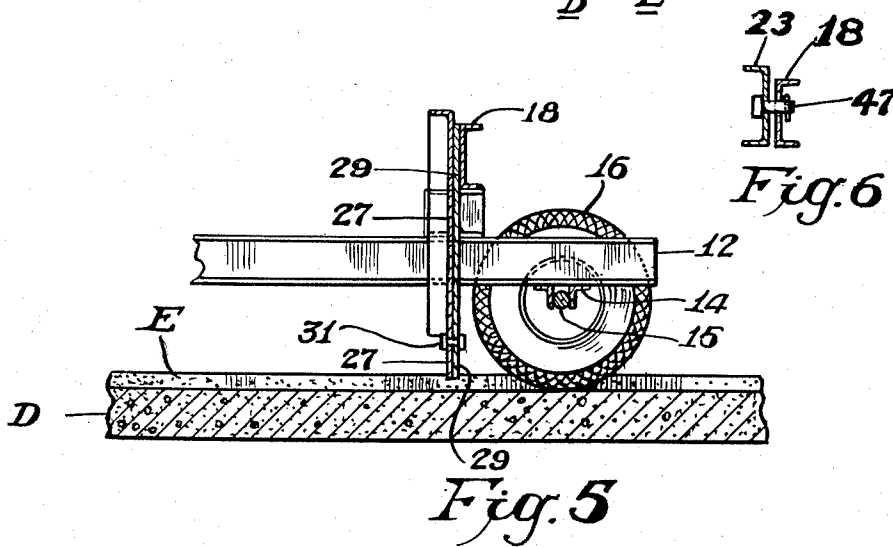


Fig. 5

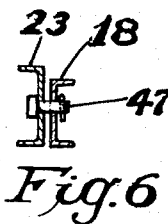


Fig. 6

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TRAVELING SCAFFOLD FOR BRIDGES
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3 Claims. (Cl. 304—9)

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The present invention relates generally to scaffolds and it relates more particularly to traveling scaffolds for use on bridges and like elevated structures.

An object of the present invention is to provide a new and useful scaffold construction. Another object of the present invention is to provide a novel traveling scaffold for use on bridges and like elevated structures. Still another object of the present invention is to provide an improved traveling bridge scaffold or the like, which is relatively simple and inexpensive to construct and which can be operated with ease and safety, so as to afford ready access to the underside of the bridge or like elevated structure, throughout the entire length thereof, and which can be readily manipulated so as to clear spaced supporting columns, cross-beams and other projecting obstructions. A further object of the present invention is to provide a traveling scaffold for bridges and the like elevated structures having a carriage adapted to rest upon and move easily along the roadway of the bridge; and having a cantilever-type platform adapted to be supported upon the carriage and to extend laterally outwardly therebeyond and inwardly in relatively close proximity to the underside of the roadway-supporting structure so as to give ready access thereto during construction and/or maintenance; and having means for swinging the platform outwardly so as to enable it to clear supporting columns, beams, trusses and other projections or obstructions and thereby to permit the scaffold to be moved along substantially the entire length of the bridge.

Other objects and advantages of the present invention are apparent in the following detailed description, appended claims, and accompanying drawings.

For the purpose of illustrating the invention, there are shown in the accompanying drawings forms thereof which are presently preferred and which have been found in practice to give satisfactory results. It is to be understood, however, that the invention is not limited to the precise arrangements and instrumentalities shown, and that the several parts and elements can be variously arranged and organized, without departing from the spirit or essential attributes of the invention.

Referring to the accompanying drawings in which like reference characters indicate like parts throughout:

Figure 1 is a perspective view showing the traveling scaffold as it appears in use during the construction of a bridge.

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Figure 2 is a vertical cross-sectional view generally along the line 2—2 of Fig. 1.

Figure 3 is an enlarged fragmentary perspective view of the platform portion of the embodiment of Figs. 1 and 2.

Figure 4 is a top plan view of the embodiment of Figs. 1-3, portions of the bridge roadway being broken away better to reveal the construction of the scaffold.

Figure 5 is a fragmentary vertical cross-sectional view generally along the line 5—5 of Fig. 4.

Figure 6 is a fragmentary vertical cross-sectional view generally along the line 6—6 of Fig. 4.

In Figs. 1-6, there is shown one embodiment of the present invention, which includes a carriage, indicated generally by the reference character 10, comprising longitudinally-extending side chassis or frame members 11 and 12 (each made up of a pair of superimposed I-beams, as best shown in Fig. 2), and transversely-extending end chassis or frame members 13 and 14, fastened to the underside of the members 11 and 12, and carrying, at their ends, axles 15, upon which are mounted four wheels 16. For purposes of illustration, the traveling scaffold of the present invention is shown in use during construction of a bridge, which is indicated, schematically, as made up of a plurality of spaced trestles, each having a base or foundation (not shown), a pair of vertical, transversely-spaced columns A, and a cross-beam B, connecting the upper ends of the columns A and extending outward somewhat therebeyond. Resting upon, and supported by, the cross-beams B, are a plurality of longitudinally-extending, transversely-spaced I-beams C, which in turn support a roadway D of newly poured reinforced concrete, having side curbs E. The wheels 16 of the carriage 10 rest upon, and are adapted to roll along, the roadway D, with the wheels on one side adjacent one of the curbs E, as shown in Figs. 2, 4 and 5.

Mounted on top of the chassis members 11 and 12, are a pair of transversely-extending U-beams 17 and 18, which protrude laterally somewhat beyond the wheels 16. Extending along the inner ends (i. e. the ends farther from the curb E) is a longitudinal platform 19 carrying, adjacent one end thereof, a windlass 20.

An underhung cantilever-type platform-member, indicated generally by the reference character 21, is pivotally mounted on, and supported by, the carriage 10 in a manner to be described below.

The platform-member 21 includes a pair of

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spaced, normally horizontal, uppermost structural members 22 and 23, the inner ends of which are disposed in overlapping, side-by-side relationship to the outer ends of the U-beams, while the outer ends of the members 22 and 23 extend substantially beyond the edge of the roadway D. Connecting members 24 and 25 are welded or otherwise suitably secured to the upper edges of the structural members 22 and 23 and serve rigidly to interconnect the inner and outer ends respectively of said structural members.

The innermost ends of the structural members 22 and 23 are provided with right-angular extensions 26 and 27 respectively, which normally extend vertically downwardly therefrom, as shown in solid lines in Fig. 2, in juxtaposed relation to generally similar downward extensions 28 and 29 secured to the U-beams 17 and 18 somewhat inside the chassis member 12. The extensions 26 and 27 are pivotally connected to the extensions 28 and 29 by pivot pins 30 and 31 passing through aligned holes formed therein adjacent the lower ends thereof; the pivot pins being disposed below the level of the chassis members 13 and 14, as shown in Fig. 2.

Removable locking-pins 46 and 47 are adapted to be fitted into aligned holes in the U-beams 17 and 18 (near the outer ends thereof) and the structural members 22 and 23, so as to lock the latter to the U-beams in horizontal position, with the lower edges of the structural members 22 and 23 resting upon the top of the chassis member 12, as shown in Figs. 2 and 4.

The outermost ends of the top structural members 22 and 23 are rigidly secured to the outermost ends of the lowermost, normally horizontal, inwardly extending structural members 32 and 33 of the platform member 21, by normally vertically disposed perpendicular side members 34 and 35 and crossing diagonal members 36 and 37. Downwardly and inwardly inclined side rails 38 and 39 extend from the structural members 34 and 35 to the inner ends of the lowermost structural members 32 and 33, which terminate generally at the center line of the roadway D, the rails relatively closely clearing the bottoms of the I-beams C when in the normal working position shown in solid lines in Fig. 2, but being above the level of the bottoms of the cross-beams B.

Suitable struts or bracing members 40 connect the members 22—32—34, while similar struts 41 connect the members 23—33—35 to provide a rigid cantilever-type construction for the platform-member 21. Suitable struts or bracing members 42 and 43 similarly connect the members 32—33 and 33—39 respectively, as shown in Figs. 1, 2 and 3.

As indicated particularly in Figs. 1 and 3, beams 44 extend intermediate the lowermost structural members 32 and 33 of the platform-member 21, and provide support for flooring panels 45, upon which workmen or inspectors can stand for safe access to the I-beams C and the underside of the roadway D, during construction, inspection, maintenance or repair of the bridge, viaduct or other elevated structure, with the locking-pins 46 and 47 locking the platform-member 21 in the normal working position shown in Fig. 1 and in solid lines in Fig. 2.

It is apparent that, by pushing or otherwise moving the carriage 10, the scaffold can be shifted between trestles to give workmen, etc. progressive access to the underside of the bridge structure so as to facilitate installation or removal of

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temporary deck-forms for the concrete roadway, by way of illustration.

However, to permit the scaffold to pass beyond trestles and thereby to enable it to be used on successive spans of the bridge or the like, I provide means for shifting the platform-member 21, from its normal working position, shown in solid lines in Fig. 2, to the position shown in dash-dot lines in Fig. 2, wherein the structural members 22 and 23 extend vertically upwardly, the members 34—35—36—37 extend horizontally outwardly beyond the roadway, and the members 32—33 and 38—39 extend downward laterally beyond the trestle, so as to enable the platform-member to clear the vertical column A and the cross-beam B, while the carriage is being moved (for example, from left to right in Fig. 1).

The aforesaid shifting means comprises a flexible cable or rope 48, secured at one end to a projection 49 on the top of the chassis member 11, and passing over pulleys 50 and 51 hooked to apertured anchorage-members 52 and 53 fastened to the upper side of the connecting member 25 adjacent the ends thereof; the other end of the cable or rope 48 being wrapped around the drum of the windlass, so that, after the locking-pins 46 and 47 have been removed from the locking position shown in Fig. 6, operation of the windlass handle will shorten the effective length of the cable or rope 48 and, in so doing, will shift the platform-member 21 from the solid-line working position of Fig. 2 to the dash-dot trestle-bypassing position of Fig. 2.

After the trestle has been cleared, the windlass handle is oppositely rotated to lower the platform-member back to its normal working position, after which the locking-pins are re-inserted and the workmen (who, of course, had left the platform prior to its being up-ended) return to the platform-member to begin work on the next span of the bridge or viaduct.

The carriage and platform-member are so proportioned and the weight thereof so distributed that the center of gravity of the scaffold is always inside of the outer wheels, whether the platform-member is in the normal working position or the up-ended trestle-clearing position, so that there is never any tendency for the carriage to tilt (clockwise in Fig. 2) sideways and upset.

If desired, a pair of scaffolds can be mounted, one at each edge of the roadway, so that the platforms thereof terminate adjacent each other at the center of the underside of the bridge and thereby give access to the entire width of the bridge underside at the same time, the two carriages being moved simultaneously. In this arrangement, the carriages and/or the inner ends of the lowermost structural members can be rigidly interconnected to ensure synchronous movement of the two scaffolds.

Of course, the relative proportions of the scaffold can be varied to adapt it to particular installations and uses. By way of illustration, the vertical clearance of the top structural members 22 and 23 could be increased to allow for guard rails on the roadway, such as would be installed on a completed bridge or viaduct, while the lower portion of the platform-member could be lowered to give greater clearance beneath the I-beams to facilitate movement along the flooring 45.

It is readily apparent that the novel traveling scaffold of the present invention can be manufactured easily and inexpensively from standard structural elements, and provides safe and ready

access to the underside of elevated structures so as greatly to reduce the time and hazard involved in construction, inspection, maintenance and repair thereof. It is also obvious that, after a job at one site has been completed, the scaffold can be readily disassembled into its carriage and platform components, simply by removal of the pivot-pins, to facilitate transportation to, and reassembly at, a new site.

The present invention may be embodied in other specific forms and, accordingly, the foregoing embodiments are to be considered merely as illustrative, and not restrictive, reference being made to the appended claims, rather than to the above specification, as indicative of the scope of the invention.

I claim as my invention and desire to protect by Letters Patent, the following:

1. A traveling scaffold for a bridge or like elevated structure, including a carriage constructed and arranged to rest on and move along an upper surface of said bridge generally adjacent one edge thereof, said carriage having a chassis and a plurality of wheels mounted on either side thereof, and a cantilever-type platform-member supported from said carriage, said platform-member having structural-means constructed and arranged to extend generally horizontally outwardly from said carriage beyond the adjacent edge of the bridge, and having structural-means constructed and arranged to extend downwardly from the outer end of the first-mentioned structural-means, and having structural-means constructed and arranged to extend generally horizontally inwardly from the lower end of the second-mentioned structural-means to a point substantially beyond the inner side of the carriage, said last-mentioned structural-means including a working platform disposed relatively adjacent the underside of the aforesaid upper surface and providing access to said underside, the center of gravity of the

scaffold falling in a plane laterally intermediate the sides of the chassis so that there is no tendency for the carriage to tip over sideways when in use, the platform-member being pivotally connected to the chassis with the axis of pivotation laterally intermediate the sides of the chassis and somewhat below the wheel axes, the platform-member being tiltable through approximately 90 degrees so as to position its last-mentioned structural-means in downwardly-extending generally vertical position outside the adjacent edge of the bridge so as to enable the platform-member to clear underlying bridge projections during movement of the carriage, the center of gravity of the scaffold in up-tilted position still falling in a plane laterally intermediate the sides of the chassis.

2. A construction according to claim 1 wherein the scaffold includes means for mechanically raising and lowering the pivotally-mounted platform-member to and from its up-tilted position, and means for locking the platform-member selectively in either its raised position or its lowered position.

3. A construction according to claim 2 wherein the raising and lowering means comprises a windlass mounted adjacent the inner edge of the carriage chassis and constructed and arranged to actuate the platform-member through a cable-and-pulley system operatively connected to the first-mentioned structural means adjacent the outer end thereof.

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