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WO 88/07605 A

(58) Field of search
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(54) Mobile access bridge

(57) A mobile access bridge has two walkway sections (10, 12) pivotally connected by a hinge joint (14) so that the outer section (12) can be raised and lowered by a winch (44). The inner section (10) suitably has wheels (26, 28) for supporting and manoeuvring the inner end of the bridge on the shore and the outer section (12) is provided with floats (32) to support the extended bridge in the water while it is being manoeuvred outwardly to reach onto a remote location (50).

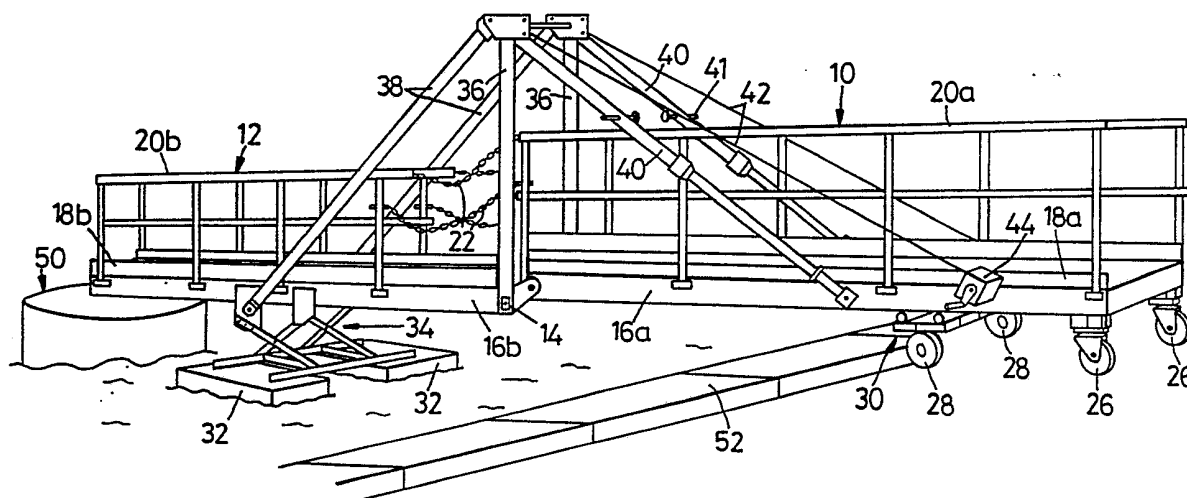


Fig. 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

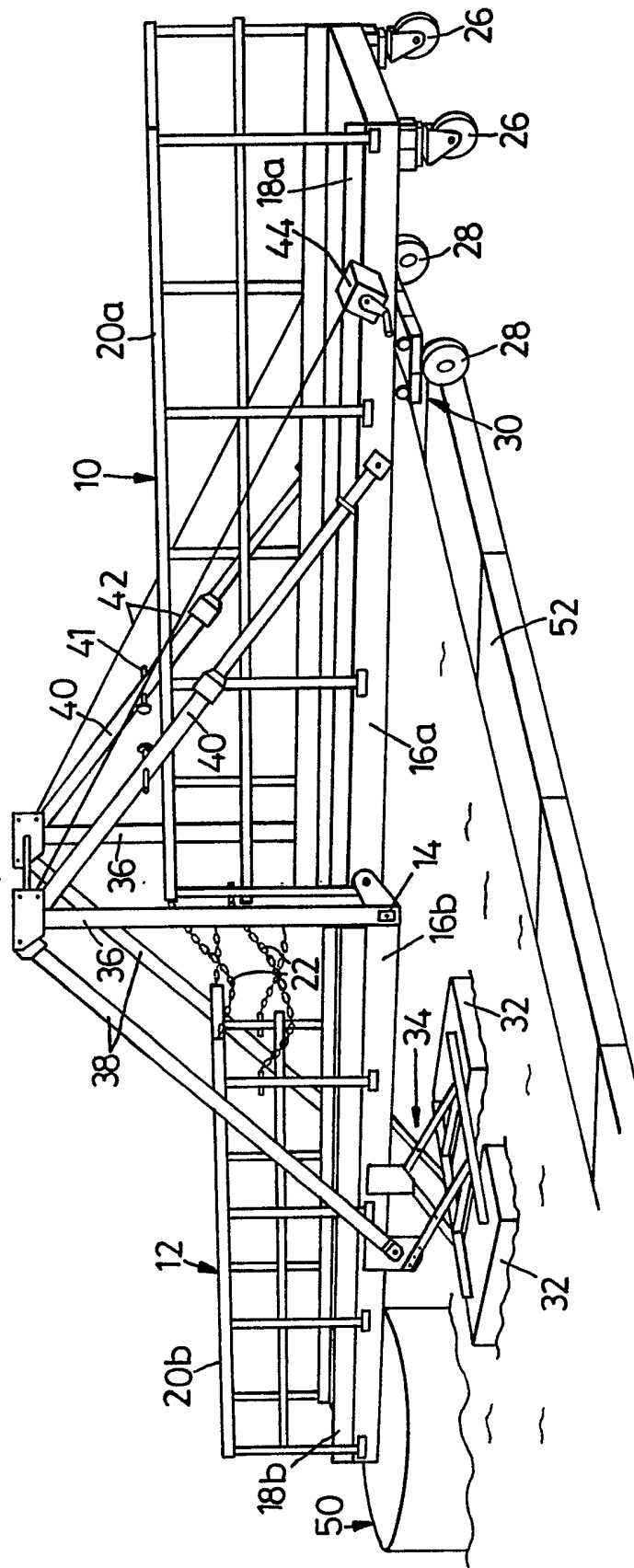


Fig. 1

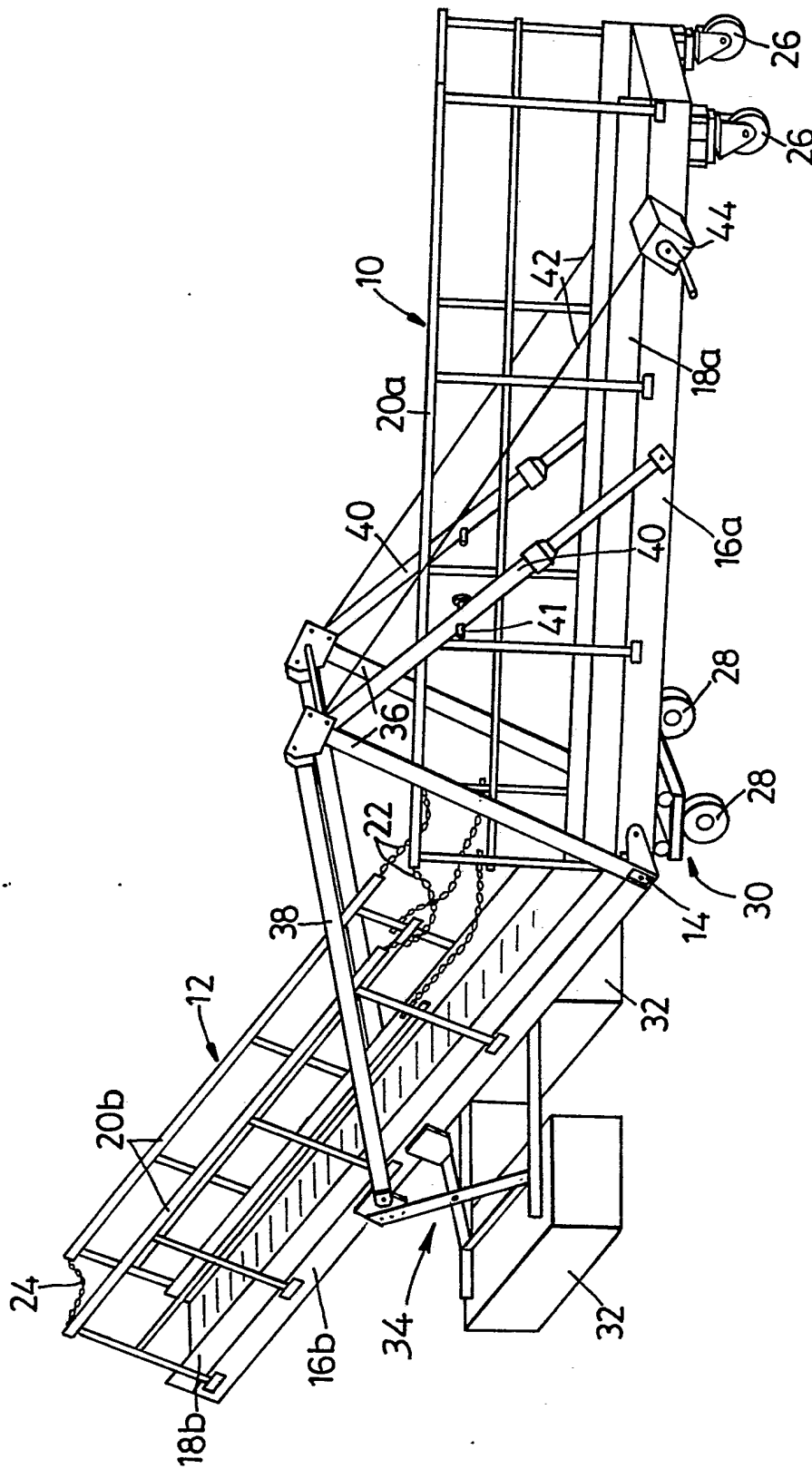


Fig. 2

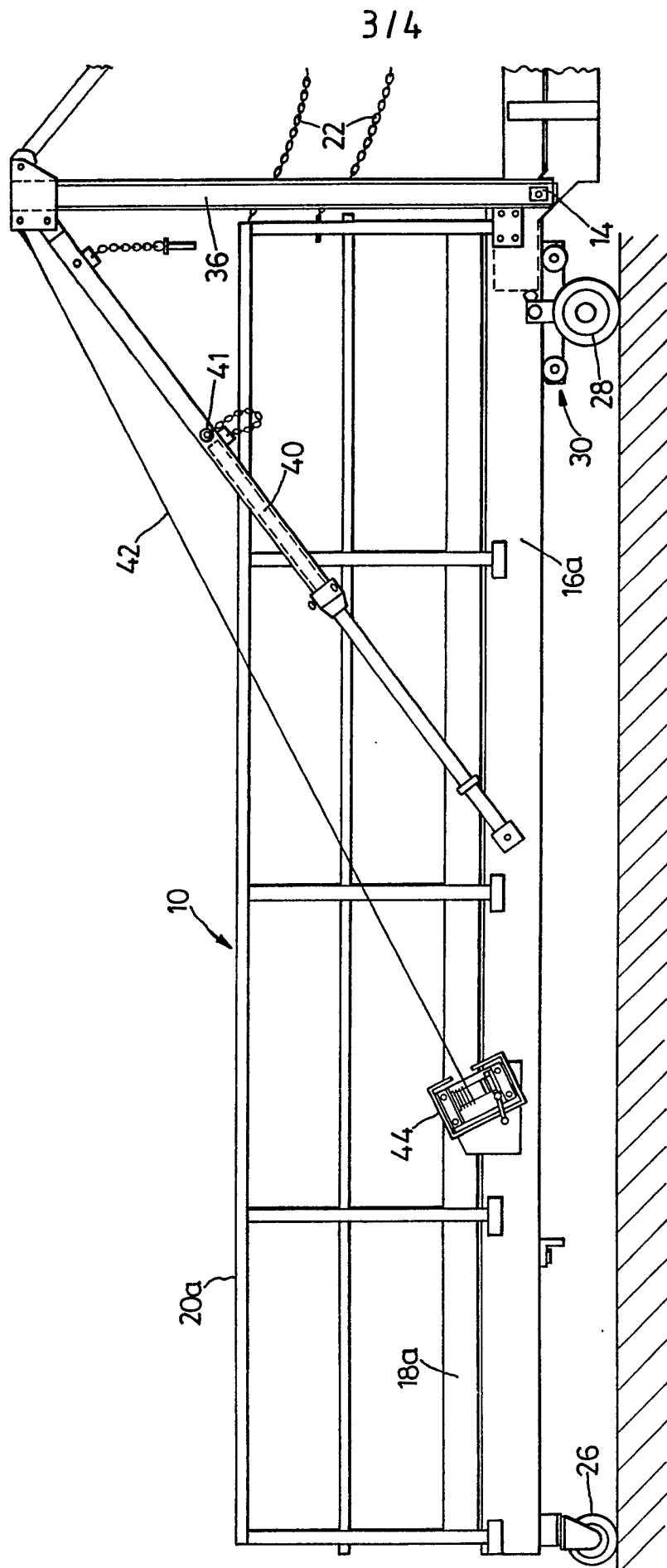


Fig. 3A

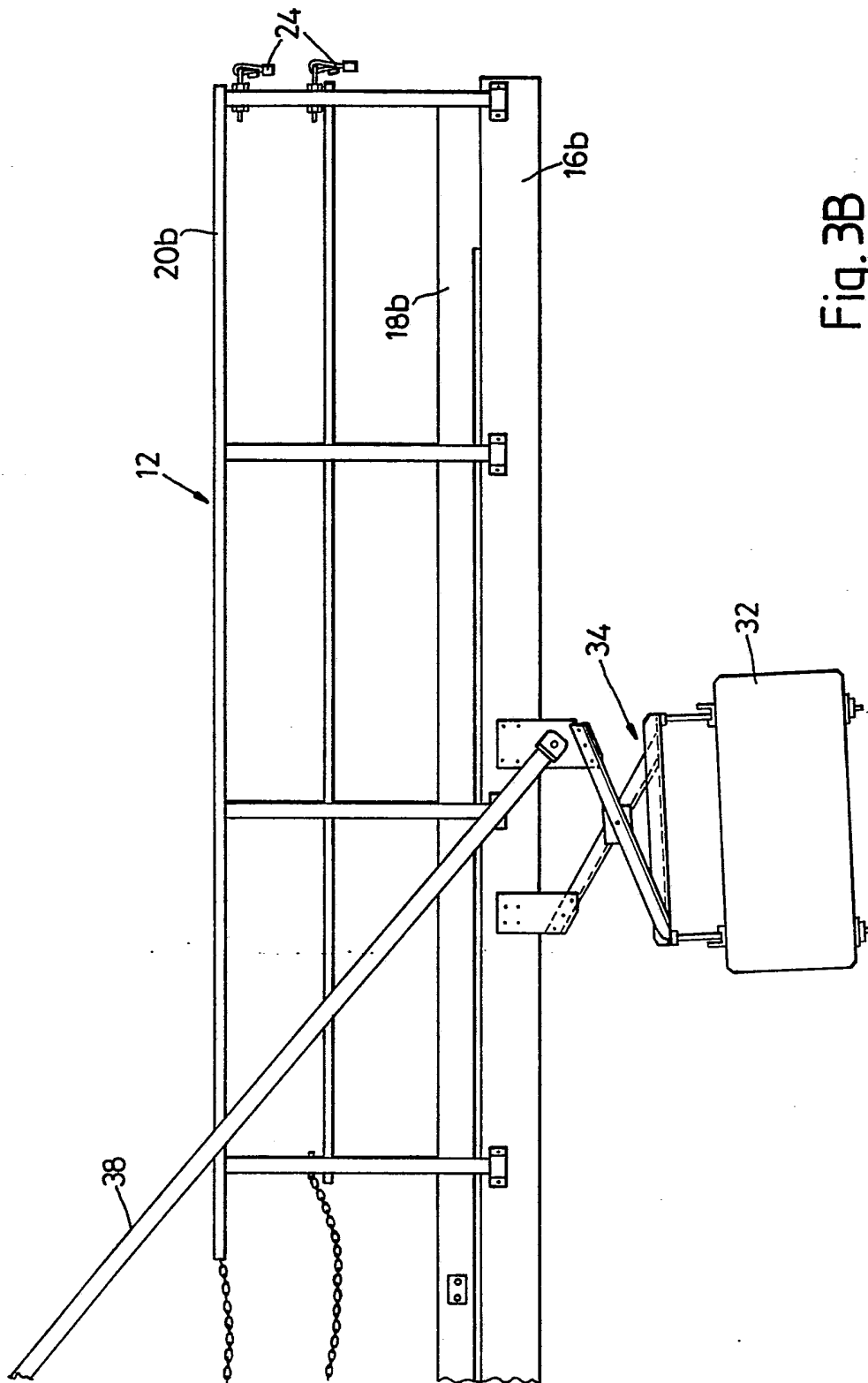


Fig. 3B

MOBILE ACCESS BRIDGE

This invention relates to mobile access bridges for facilitating the crossing of stretches of water particularly for maintenance of equipment surrounded by the water. While the invention is described with particular reference to the maintenance and servicing of fixed equipment associated with sewage and effluent treatment ponds and tanks it is to be understood that the invention may also have applications in other situations where a temporary access walkway is required e.g. for maintenance work on rivers, canals or docks or, possibly, for emergency use.

It is also to be understood that the term "water" is used herein to include other liquids or semi-liquid such as effluent, slurry or the like.

The object of the invention is to provide an access bridge which is economical to provide and use, which provides substantial savings in avoiding the need for fixed or permanent walkways and access bridges which would otherwise have to be provided, which is simple, safe and reliable in use, and which is easily operated with a minimum work force.

According to the invention a mobile access bridge for crossing a stretch of water comprises a first elongate walkway section carried on ground engaging elements, a second elongate walkway section having a proximal end portion pivoted to a distal end portion of the first section to form an extension thereof and provided with float means enabling the sections, held rigidly in their operative relationship, to be projected across the water until a distal end portion of the second section rests on a suitable abutment, and lifting gear for selectively pivoting the second section from an operative position to a raised position at which the float means is raised from the water to facilitate positioning and removal of the bridge.

Preferably the first section is slidably engaged on some or all of the ground engaging elements for movement relative thereto during said projection and subsequent withdrawal.

It is also preferred that the float means is adjustably mounted on the second section to vary the spacing of the latter below said section.

Conveniently the sections are constructed from lightweight materials, e.g. fibre reinforced plastics and/or aluminium alloy to facilitate handling and manoeuvrability.

An example of the invention is now more particularly described with reference to the accompanying drawings wherein:-

Figure 1 is a diagrammatic perspective view of a mobile access bridge in its position of use,

Figure 2 is a like view of the bridge with its second walkway section raised for manoeuvring, and

Figure 3a/b is an enlarged side elevation of the bridge.

The bridge includes a first elongate walkway section 10 and a generally similar second elongate walkway section 12, the proximal end of the latter section being pivotally connected to the distal end of the first section 10 by a hinge pivot 14 so that section 12 can be raised and lowered between the positions shown in Figures 1 and 2.

Each section comprises a generally channel section main beam 16a, 16b providing the floor of the respective walkway parts, and upstanding toe panels 18a, 18b along each side together with hand rails 20a, 20b.

To allow for the hinging of the sections the respective parts of the hand rails are interconnected by flexible chains 22 and removable safety chains 24 (Figure 2) are also provided at the distal extremity of the walkway.

In this example the pivotal connection 14 is carried on a cranked extension of section 10 so that section 12 is dropped somewhat below section 10 when the floors of both sections are horizontal as shown in Figure 1 but it will be appreciated that the bridge may be constructed so that the respective sections are in various relationships, for some applications the distal section 12 may be at a higher level than the proximal or inboard section 10.

Section 10 is carried on ground engaging wheels to facilitate manoeuvring and positioning and, as the major portions of the bridge are constructed from lightweight materials including substantial parts made from fibre reinforced plastics, the whole structure can readily be manoeuvred and operated by a two-man team.

Said wheels comprise a pair of rear castor wheels 26 which are mounted at fixed locations at the extreme proximal end of section 10, and a pair of larger non-castor pneumatic tyred wheels 28 forming part of a bogey assembly 30.

Brakes are provided for selectively locking all or any of the wheels 26, 28. The main walkway part of section 10 can be moved longitudinally with respect to bogey 30 so that wheels 28 may lie under the extreme distal end portion of section 10 as shown in Figures 2 and 3 or may lie at positions spaced from said end portion and nearer to wheels 26 e.g. as shown in Figure 1.

A pair of outrigger floats 32 are mounted below approximately the mid-portion of second section 12 on a downwardly dependant framework 34 which includes a scissors-type linkage enabling the height of section 12 above floats 32 to be selectively adjusted. Various forms of float may be employed, in this example they are formed as blocks of foam filled fibre reinforced plastics but hollow pontoon floats could be used. Floats 32 are carried on respective projecting arms extending laterally

beyond the main walkway section to provide lateral stability.

The bridge further includes lifting gear for raising and lowering section 12 and retaining the sections rigidly in their position of use or with section 12 raised. Said gear comprises a pair of posts 36 having their lower ends mounted on each side on pivot 14, their upper ends being linked to the centre region of section 12 by a pair of tension stays 38 to form a cantilever linkage. Retractable stays 40 link the tops of posts 14 with the centre region of the first section 10, these stays having two telescopically engaging parts which can be secured at selected effective lengths by removable cross pins 41 inserted through the stays.

Cables 42 are anchored to the top of posts 14 and are operated by hand operated winches 44 (one only shown) mounted towards the proximal end of section 10.

With the securing pins removed from stays 42 winches 44 can be operated to raise section 12 from the Figure 1 to the Figure 2 position, or to lower it from the latter position.

It will be appreciated that other forms of lifting gear might be employed, for example hand or power operated screw or hydraulic jacks or rams e.g. built into the retractable stays 40, or other forms of linkage and/or cable tackle could be employed.

For some applications the range of angular movement of section 12 may be greater than that shown in the drawings, for example the lifting gear may be arranged to raise the section to a near vertical position to reduce the overall length of the bridge for facilitating transport or storage. Again, for some applications, the angular positions of use might be varied or selectively altered e.g. so that section 12 can be arranged to slope down or up from the distal end of section 10.

One typical application of the invention is to

provide access for repair or maintenance to the mechanism of rotating arm boom scrapers used in circular activated sludge treatment tanks at sewage and effluent treatment plants. Said mechanism is, of necessity, positioned at the centre of the tank so that it is surrounded by the effluent. Hitherto it has been normal practice to provide a fixed permanent access bridge leading from the edge of the tank to the centre island to gain access to the equipment. This involves very substantial capital cost, each tank has to be provided with a bridge of durable construction and there may be twenty or more such tanks at a single water authority treatment plant. There is not only the initial capital cost but also the costs of maintenance and repair of the bridges themselves.

By the use of the invention the provision of such individual permanent bridges may be dispensed with. The mobile bridge will be moved as and when required to whichever tank needs servicing.

The bridge will be manoeuvred with section 12 raised and wheels 28 under the distal end of section 10 as shown in Figure 2 until the latter wheels are adjacent the edge of the tank and floats 32 are above the water (effluent) therein. Winches 44 are then operated to lower section 12 to the horizontal position shown in Figures 1 and 3 so that the floats enter the water and carry the weight of the outer parts of the bridge. The sections are linked rigidly in this horizontal relationship by inserting the pins through the appropriate apertures in the stays 40, thus the whole bridge forms a rigid beam structure. Wheels 28 are locked but wheels 26 are left free. The two sections are then projected further beyond the edge of the tank, section 10 rolling across the now fixed bogey 30 and this movement is continued until the distal end part of the remote second section 12 slides onto the centre island 50 (Figure 1) in the middle of the tank so that it rests securely thereon. During this movement the locked wheels 28 remain at the edge 52 of the tank and floats 32 move outwardly across the water.

The bridge is then safely secured in position e.g.

by shackling or otherwise anchoring said distal end to the island 50, or, for some applications, mooring ropes may be provided extending from each side of the outer part of the bridge to fixed anchorages at the edges of the tank on either side.

The bridge can now be crossed to give safe access to the equipment (not shown) on or operated from the otherwise isolated island 50.

When work is completed the anchorages are freed, the bridge is pulled back inshore by relative movement of section 10 across bogey 30 bringing floats 32 nearer to the edge 52 of the tank, and finally stays 40 are released and the second section 12 is raised by means of winches 44, lifting floats 32 above the level of the edge of the tank i.e. with clearance above the ground on which wheels 26 and 28 rest, so that the whole bridge can be pulled back and manoeuvred to the next tank, if work is to be carried out thereon, or to be parked until next required for use.

The bridge can be used as a general purpose access platform or walkway around the treatment plant, e.g. it could be used to form a temporary footbridge across a channel or the like, or it can even be readily transported from site to site on a lorry or possibly fitted with larger road wheels to be drawn as a trailer if required.

The ground engaging elements on which section 10 rests need not be wheeled, they could include skids and/or jacking pads for adjustment of height or angling of the bridge as a whole, and/or a turntable might be included for pivoting the bridge about a vertical axis.

CLAIMS

1. A mobile access bridge for crossing a stretch of water comprising a first elongate walkway section carried on ground engaging elements, a second elongate walkway section having a proximal end portion pivoted to a distal end portion of the first section to form an extension thereof and provided with float means enabling the sections, held rigidly in their operative relationship to be projected across the water until a distal end portion of the second section rests on a suitable abutment, and lifting gear for selectively pivoting the second section from an operative position to a raised position at which the float means is raised from the water to facilitate positioning and removal of the bridge.

2. A bridge as in Claim 1 wherein the first section is slidably engaged on some or all of the ground engaging elements for movement relative thereto during said projection and subsequent withdrawal

3. A bridge as in Claim 1 or 2 wherein the float means is adjustably mounted on the second section to vary the spacing of the latter below said section.

4. A bridge as in Claim 1, 2 or 3 wherein the sections are constructed from fibre reinforced plastics, and/or aluminium alloy, and/or other lightweight materials to facilitate handling and manoeuvrability.

5. A bridge as in any preceding claim in which the ground engaging elements are wheels.

6. A bridge as in Claim 5 including brake means for locking all or any of said wheels against rotation.

7. A bridge as in any preceding claim wherein the float means include a pair of outrigger floats projecting to each side of the second section to provide lateral stability.

8. A mobile access bridge substantially as hereinbefore described with reference to and as shown in the accompanying drawings

Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

Application number

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Relevant Technical fields

(i) UK Cl (Edition L) E1G
B7A

(ii) Int Cl (Edition 5) E01D
B65G

Search Examiner

D HAWORTH

Databases (see over)

(i) UK Patent Office

(ii) ONLINE DATABASE: WORLD PATENTS INDEX

Date of Search

8 DECEMBER 1992

Documents considered relevant following a search in respect of claims 1-8

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	WO 88/07605 A (IVARSSON)	1-4 and 7

Category	Identity of document and relevant passages	Relevant to claim(s).

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

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