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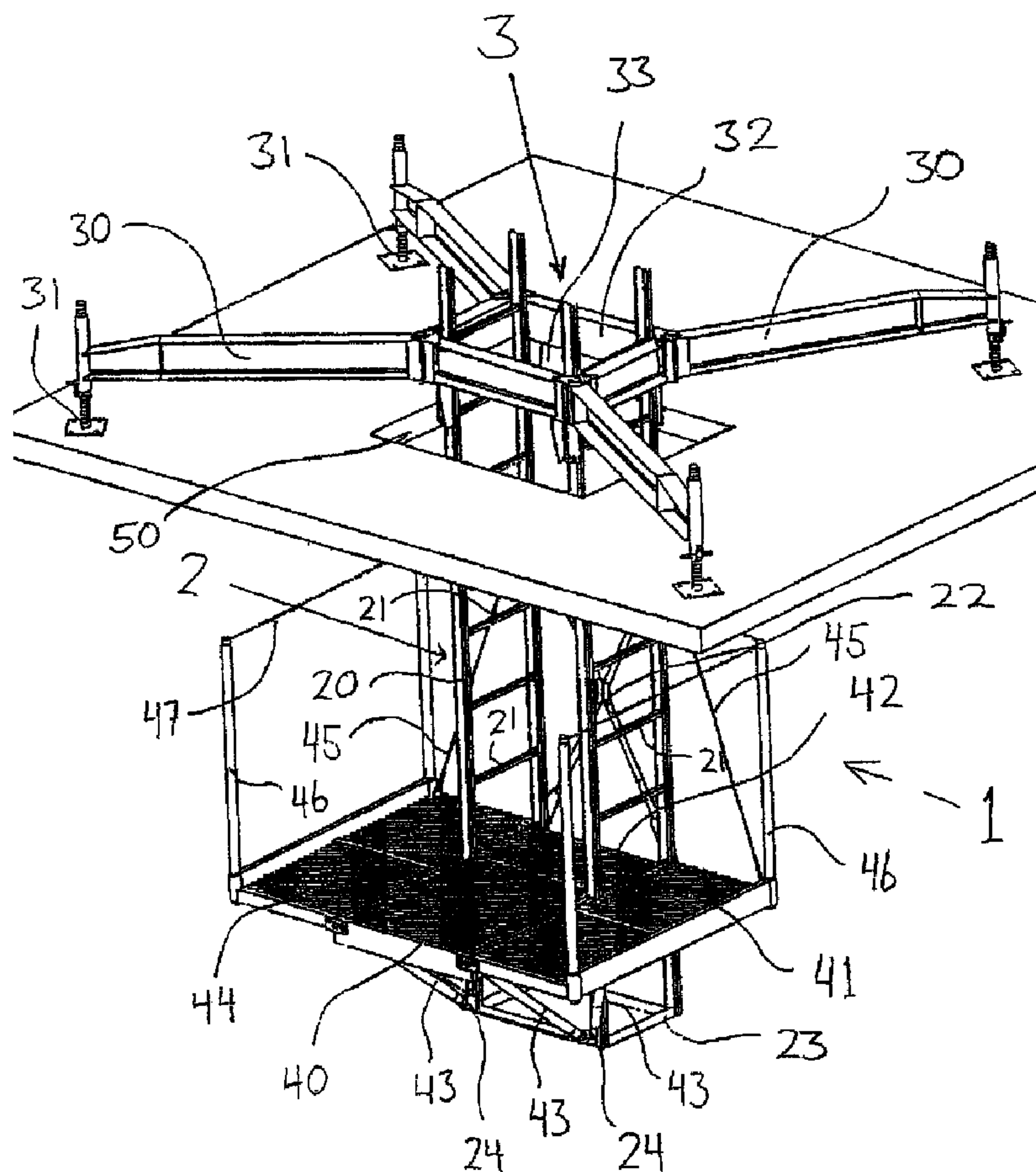
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(54) Titre : APPAREIL D'ACCES

(54) Title: ACCESS APPARATUS



(57) Abrégé/Abstract:

An access apparatus is provided, the apparatus comprising a suspension structure, a support structure adapted to suspend said suspension structure through an access opening, and a platform assembly, the platform assembly comprising a platform structure



(57) **Abrégé(suite)/Abstract(continued):**

moveable between a stowed position substantially adjacent said suspension structure and a working position extending outwardly from said suspension structure, to facilitate suspension and deployment of the access apparatus in a covered cavity or reservoir through a restricted access opening.

Abstract

An access apparatus is provided, the apparatus comprising a suspension structure, a support structure adapted to suspend said suspension structure through an access opening, and a platform assembly, the platform assembly comprising a platform structure moveable between a stowed position substantially adjacent said suspension structure and a working position extending outwardly from said suspension structure, to facilitate suspension and deployment of the access apparatus in a covered cavity or reservoir through a restricted access opening.

ACCESS APPARATUS

Field of the Invention

This invention relates to an access apparatus, and especially access apparatus for
5 providing access downwards through an access opening.

Background of the Invention

Covered cavities or reservoirs, such as water storage reservoirs, sometimes require
a user to access the interior void, for example, for purposes of inspection, repair, or
10 cleaning work. Such reservoirs most often provide access through a manhole or
access opening in a roof of the reservoir. The size of the access opening is typically
very limited and for example, may have a width of less than 1 m.

If it is necessary to inspect the ceiling or roof of a reservoir, this is usually performed
15 by a user kneeling in an inflatable boat floating upon the surface of the water. The
water level needs to be high enough so that the user can inspect the roof while
paddling the boat across the water surface, or using the roof to pull the boat across
the water.

20 Some covered reservoirs are provided with an internal steel walkway fixed against a
side wall towards the top of the reservoir. As such reservoirs often have a water
level close to the roof, however, the walkway is usually submerged. Therefore, it is
prone to corrosion, requiring thorough and regular safety inspections.

25 In addition, to perform an inspection of the ceiling of such a reservoir, the water level
must be lowered below that of the internal walkway. A deflated boat is then passed
through the access opening and inflated by a user on the platform. However, the
water level in the reservoir is then too low to permit adequate inspection of the ceiling
from the boat and so the water level needs to be raised to the required level. After
30 inspection the boat can be deflated and removed through the access opening. This
may, in some circumstances, require the water level to be lowered again to allow the
user access to the platform.

The reservoir is usually emptied to permit inspection by waiting for the water to be consumed in normal use. Emptying and refilling the reservoir to permit inspection of the ceiling can take many hours as it is dependant on consumer demand.

- 5 If the reservoir is not provided with an internal platform, access to the reservoir may be prohibited by laws such as New Zealand's Health and Safety Regulations. These regulations required that the reservoir be taken out of service, drained, and a scaffold erected internally. This is often not practical due to water demands and/or minimum water storage requirements.

10

Object of the Invention

It is therefore an object of the invention to provide an access apparatus which overcomes or at least ameliorates one or more disadvantages of the prior art, or at least to provide the public with a useful choice.

15

Further objects of the invention will become apparent from the following description.

Summary of the Invention

- Accordingly in one aspect the invention may broadly be said to consist in an access
 20 apparatus having a suspension structure, a support structure adapted to suspend said suspension structure through an access opening, and a platform assembly, the platform assembly comprising a platform structure moveable between a stowed position substantially adjacent said suspension structure and a working position extending outwardly from said suspension structure.

25

Preferably said moveable platform structure consists of a first platform pivotally mounted on said suspension structure for pivotal movement between said stowed and working positions.

- 30 Preferably the platform assembly also comprises a fixed platform on the suspension structure substantially planar with said platform structure when in the working position.

Preferably said moveable platform structure includes one or more second platforms each movable about two independent axes for movement between said stowed and working positions.

- 5 Preferably the or each second platform is pivotally mounted to said first platform, whereby the or each second platform is pivotable with respect to both the first platform and the suspension structure for movement between the stowed and working positions.
- 10 Preferably the access apparatus includes a locking mechanism, whereby the moveable platform structure may be locked in place in the working position to prevent the platform structure pivoting inadvertently.

- Preferably the locking mechanism comprises at least one locking bolt which may, in
15 use, be extended from the fixed platform to engage with the or each second platform.

Preferably the first platform has a width substantially equal to that of the suspension structure, thereby minimising overhang in the stowed position.

- 20 Preferably the or each second platform has a width substantially equal to or less than that of the corresponding adjacent sides of said suspension structure when in the stowed position, thereby minimising overhang in the stowed position.

- Preferably said platform structure is supported by at least one propping means, said
25 propping means being sufficient to support the weight of at least one human upon the platform assembly when in its working position.

- Preferably said propping means consists of one or more extensible telescopic rods movably mounted to said suspension structure and to said platform structure at
30 opposing ends.

Preferably the or each telescopic rod is moveably mounted such that the platform structure is permitted to move between the stowed and working positions.

Preferably the or each telescopic rod is mounted to said suspension structure by way of coupling with a fulcrum protruding therefrom.

5 Preferably the or each telescopic rod is moveably mounted to said platform structure by way of coupling with a fulcrum protruding therefrom.

Preferably said fulcrums protrude at an angle substantially coaxial with said telescopic rod when in the working position.

10 Preferably said angle is between 22.5° and 67.5° .

Preferably said angle is substantially equal to 45° .

15 Preferably said fulcrums protrude to the extent that said platform structure is permitted to pivot through an angle substantially equal to 90° .

20 Preferably the or each fulcrum adapted to couple with a telescopic rod supporting a first platform includes a coupling permitting said telescopic rod to pivot about a single axis.

Preferably the or each fulcrum adapted to couple with a telescopic rod supporting a second platform includes a coupling permitting said telescopic rod to swivel in three dimensions in moving between the stowed and working positions.

25 Preferably said coupling comprises a ball joint whereby said second platform is permitted to pivot about two independent axes.

30 Preferably said movable mounting permits said telescopic rod to swivel with respect to said fulcrum.

35 Preferably said platform structure is supported by four telescopic rods coupled to the suspension structure by way of two protruding suspension fulcrums provided on adjacent corners of said suspension structure, each fulcrum being provided with two couplings, at least one coupling permitting movement of the corresponding rod in three dimensions, and coupled to the platform structure by way of four protruding

platform fulcrums, two of said platform fulcrums being provided on the outer corners of the first platform, and one platform fulcrum permitting movement of the corresponding rod in three dimensions being provided on each of the second platforms, whereby said first platform is pivotable upwardly relative to said suspension structure, and said second platforms are pivotable about two axes between the working and stowed positions.

Preferably the platform assembly includes at least one grating panel adapted to provide a substantially planar surface when said platform is in the working position.

10

Preferably the suspension structure consists of a framework including a plurality of spaced-apart substantially horizontal rungs at fixed intervals on at least one side of the suspension structure, thereby forming a ladder to provide human access between the first and second ends of the suspension structure when substantially vertical.

15

Preferably said rungs are provided on two opposing sides of said suspension structure.

Preferably the framework includes bracing members on at least one side of the suspension structure to improve torsional rigidity of the suspension structure.

20

Preferably said framework includes a base frame member provided at or adjacent an end of said suspension structure.

Preferably said framework consists of two opposing ladders secured together by said bracing and said base frame member.

25

Preferably the framework permits a human to climb the ladder internally with respect to said framework.

30

Preferably at least a portion of one side of the suspension structure is substantially open, said side being adjacent said platform assembly when in the stowed position.

Preferably the support structure consists of a plurality of stabiliser arms extending substantially radially from said suspension structure.

35

Preferably said stabiliser arms are provided with adjustable feet at their distal ends, whereby the suspension apparatus may be adapted for use on an uneven surface.

- 5 Preferably the support structure includes a collar adapted to be provided about said suspension structure, thereby providing an opening for access through the collar and suspension structure, and further adapted to engage with said plurality of stabiliser arms and said suspension structure.
- 10 Preferably the collar is adapted to engage with said suspension structure in any one of two or more positions along the length of the suspension structure, thereby providing for suspension of the platform assembly at multiple depths.

- 15 Preferably the collar is adapted to engage with said suspension structure via a bolt or pin inserted through a pair of opposing rungs of said suspension structure.

Preferably the platform assembly is provided with barrier engagement means for engagement of a safety barrier.

- 20 Preferably the safety barrier consists of a plurality of removable barrier posts which may be inserted in and removed from said barrier engagement means, the barrier posts being adapted to support a safety rope between adjacent posts.

- 25 Further aspects of the invention, which should be considered in all its novel aspects, will become apparent from the following description.

Brief Description of the Drawings

A number of embodiments of the invention will now be described by way of example with reference to the drawings in which:

- 30 **Figure 1** is a perspective view of a first embodiment of a suspension apparatus according to the present invention, shown in a working position;
- Figure 2** is a perspective view of the suspension apparatus of Figure 1 shown in a substantially stowed position, shown with the second platforms in their second position (grating panels not shown for clarity);

Figure 3 is a perspective view of the suspension apparatus of Figures 2 and 3 shown in a stowed position (grating panels not shown for clarity);

Figure 4 is a partial perspective view of the suspension structure and platform assembly of the embodiment of Figures 1-3, showing the underside of the platform assembly in the working position;

Figure 5 is a plan view of the embodiment of Figures 1-4, showing the platform assembly in the working position;

Figure 6 is a front and side view of a fulcrum suitable for use with the embodiment of Figures 1-5; and

Figure 7 is a side view of the fixed platform showing the locking mechanism.

Detailed Description of the Drawings

The present invention consists in a suspension apparatus providing improved access by suspension through an access opening. The invention has particular application to water storage tanks, stormwater or wastewater drains and the like which commonly provide human access to an internal void via an access opening or manhole on a top surface.

It will be appreciated, however, that the invention may be used in any application where vertical access is required, especially through a restricted opening. For example, the invention could be suspended through an access opening in the deck of a bridge to inspect the underside of the bridge deck. However, the invention will be described below by reference to a preferred embodiment of a suspension apparatus according to the invention which is adapted to provide human access to the internal void of a covered or underground water reservoir.

The invention provides a platform which may be deployed through an access opening and suspended within the internal void of a reservoir. Referring first to Figure 1, a vertically suspended access apparatus according to the invention is shown generally referenced 1. The suspension apparatus 1 consists broadly of a suspension structure 2 which, in combination with the support structure 3, suspends a platform assembly 4 internally within the internal void. The suspension apparatus is adapted to support at least one user and their required tools and equipment.

The support structure 3 is provided on the exterior of the reservoir and preferably consists of a collar 32 engaged with the suspension structure 2 and a plurality of stabiliser arms 30 extending radially from the suspension structure 2 and support structure 3. The purpose of the support structure 3 is to provide a stable platform
 5 from which the suspension structure 2 and platform assembly 4 may be suspended in a reservoir, tank, pipe or similar enclosed space typically used for the storage or transport of a liquid, most commonly water.

The collar 32 has an opening 33 through which the suspension structure 2 may be
 10 provided and engaged therewith. The opening 33 and corresponding passage of the suspension structure 2 are preferably of a size sufficient to accommodate a human. Each support leg 30 may be detached from the collar 32 for transport and storage purposes, and the collar 32 in turn may be detached from the suspension structure 2.

15 The suspension structure 2 and platform assembly 3 are suspended through an access passage, manhole, or access opening 50 in the reservoir. To accommodate uneven exterior surfaces in the vicinity of the access opening 50, the stabiliser arms 30 are preferably each provided with adjustable feet, typically towards their distal end for improved stability.

20

The suspension structure 2 preferably consists of a framework which includes a plurality of rungs 21 mounted transversely along the length of the suspension structure 2. Preferably, at least a portion of the rungs provided towards a first end of the suspension structure 2 are substantially hollow rungs provided in pairs on
 25 opposing sides of the suspension structure 2, whereby the collar 32 may be engaged with the suspension structure 2 by insertion of a pin or bolt through a pair of opposing rungs 21 and corresponding holes provided in the collar 32. The depth at which the platform assembly 4 is suspended within the internal void may therefore be adjusted by the selection of an appropriate pair of opposing rungs 21 with which the collar 32
 30 is to be engaged.

As mentioned above, the framework of the suspension structure 2 provides an internal passage whereby the rungs form a ladder allowing a user to descend down the framework, internally with respect to the framework, towards the platform

assembly 4 provided towards the second end of the suspension structure 2, and climb towards the first end of the suspension structure 2 as required.

5 In addition to opposing pairs of rungs 21 disposed along the length of the suspension structure 2, the framework preferably includes a bracing member 22 provided on a side of the suspension structure 2 for rigidity. The remaining side of the suspension structure 2, or at least a lower portion towards the second end thereof, is preferably open, permitting a user to step away from the suspension structure 2 on the platform assembly 4.

10

The suspension structure 2 may consist substantially of a pair of standard ladders, such as those available from Ullrich Aluminium of Manukau City, New Zealand. The ladders are preferably each 3 metres in length with a width of 460mm. Completing the framework is the bracing member 22 referred to above, and a base frame member 23, which both help to maintain the opposing ladders in position and improve torsional rigidity. The overall length of the suspension structure may be adapted to the application of the access apparatus 1 by using or substituting a pair of ladders of the appropriate length.

20 The platform assembly 4 preferably includes a platform structure which is pivotally hinged to the suspension structure 2 and adapted to pivot between a stowed position adjacent the suspension structure 2 to permit insertion, extraction and transport of the suspension apparatus 1, and a working position extending outwardly from the suspension structure 2. Ideally the platform structure, when in the working position, is in a plane substantially orthogonal to the suspension structure 2 as shown in Figures 1, 4 and 5, providing a substantially horizontal surface from which a user can inflate and launch a boat, for example.

30 In the preferred embodiment, the platform structure comprises a first platform 40 pivotally hinged to the open side of the suspension structure 2, and two second platforms 41 each movable about two independent axes between the stowed and working positions. The second platforms may be pivotally hinged to opposing sides of the first platform 40, thereby capable of pivoting with respect to both the first platform 40 and the suspension structure 2 as the first platform 40 pivots between the stowed and working positions.

35

The platform assembly 4 may include only the first platform 40, or the first platform 40 and a single second platform 41, among other possible embodiments.

5 From the working position as showed in Figure 1, the first platform may pivot with respect to the suspension structure 2 to the stowed position as shown in Figure 2, while the second platforms 41 pivot with respect to the first platform to their stowed positions adjacent opposing sides of the suspension structure 2 as shown in Figure 3. Preferably the suspension apparatus 1 is provided with a locking means with
10 which the platform assembly 4 may be locked in the stowed position.

The first and second platforms 40 and 41, respectively, are preferably each covered by a grating panel 44 providing a surface to support a user in the working position. The grating panels have been omitted from Figures 2 and 3 for clarity. Although the
15 use of grating panels is preferred due to their relatively light weight, non-slip, and free-draining characteristics, it will be appreciated that any alternative surface, such as aluminium diamond plate, for example, may be used instead.

Referring now to Figure 4, the underside of the platform assembly 4 is shown to be
20 supported by a plurality of propping means 43 provided between the suspension structure 2 and the platform assembly 4. These are preferably in the form of telescopic rods as shown in the preferred embodiment of the drawings. Ideally, the propping means 43 provides sufficient support to the platform assembly 4 to support the combined weight of the platform assembly 4, at least one user, and any tools or
25 equipment which might be required, including an inflatable craft and pump, for example. Ideally, the access apparatus 1 should be capable of supporting working loads of at least 200kg upon the platform assembly 4. The platform assembly 4 may also be provided with support cables 45 adapted to support the platform assembly 4 under tension in the working position.

30

The propping means 43 are preferably coupled at both ends to fulcrums provided on the suspension structure 2 and platform assembly 4. The fulcrum coupling allows the telescopic rods or propping means 43 to swivel or pivot with respect to the fulcrums 24 as the platform assembly is moved between the stowed and working positions.

The fulcrums 24 are preferably provided at the lower end of the suspension structure 2 and on an outer edge of the platform assembly 4 for maximum strength.

For the embodiment of the invention illustrated in Figures 1-5, it is necessary for the propping means 43 supporting the first platform to only pivot through a plane as the first platform 40 is pivoted about a single axis between the stowed and working positions. The first coupling 60 is one example of a simple coupling to permit this movement. For the propping means 43 coupled between the suspension structure 2 and an outer edge of a second platform 41, however, a second coupling 61 permitting movement of the propping means 43 in three dimensions is required to permit the more complex movement of the second platform 41 about two independent axes. The second coupling 61 may comprise a ball joint, for example. The fulcrum 24 of Figure 6 provides first and second couplings 60 and 61, respectively, in a single mounting plate suitable for mounting to the lower left hand of the suspension structure 2 as shown in Figures 1-4.

Referring still to Figure 6, the second coupling 61 of the fulcrum 24 projects from the suspension structure 2 at an angle of between 22.5° and 67.5° towards the corresponding fulcrum provided on the platform assembly 4. Ideally, however, this angle is substantially equal to 45° , as shown, substantially coaxial with the propping means 43 when the platform assembly 4 is in the working position in order to minimise shearing forces on the coupling. Corresponding couplings provided on fulcrums of the platform structure preferably also have this angle.

Referring to Figure 5, in which a plan view of the platform assembly 4 and suspension structure 2 (largely obscured by the collar 32) is shown, the first platform 40 and second platforms 41 preferably have a width substantially equal to that of the corresponding sides of the suspension structure 2 when the platform assembly is in the stowed position, thereby minimising overhang as shown in Figure 3. The suspension apparatus 1 in the stowed position in use may therefore be inserted and extracted through an access opening 50 which is relatively small with respect to the area of the platform assembly when in the working position.

The platform assembly 4 is preferably also provided with an engagement means to support a safety barrier. The safety barrier is preferably in the form of a number of

barrier posts 46 provided about the edge of the platform assembly 4, most preferably at the corners thereof, and supporting a safety handrail, cable or rope therebetween. The safety rope 47 is preferably provided along three sides of the platform assembly 4.

5

The platform assembly 4 preferably includes a fixed platform 42 provided within the suspension structure 2. The fixed platform 42 provides a platform for the user to stand on as the first and second platforms 40 and 41 are lowered from the stowed position to the working position.

10

Also shown in Figure 5, and in more detail in Figure 7, is a locking mechanism 48. In the preferred embodiment as shown, the locking mechanism 48 consists of a pair of sliding locking bolts which may be extended from the fixed platform 42 to engage with the second platforms 41 when in the working position. In Figure 7, the bolt of the leftmost locking mechanism 48 is not shown for clarity, while the rightmost bolt is shown in the extended or locked position.

When engaged, the locking mechanism 48 prevents the platform structure inadvertently pivoting as weight is placed on it. The locking bolts may be retracted to allow the platform structure to pivot. In the preferred embodiment of the platform structure as shown in the accompanying figures, a pair of opposing locking when extended bolts engage with the two second platforms 41, preventing the first platform 40 pivoting upwardly as weight is placed on a second platform 41.

In use, the level of liquid stored in the reservoir is lowered to the required level, if necessary. However, in most instances it will not be necessary to lower the liquid level as the distance of the platform below the access opening can be adjusted selecting the rungs 21 to which the collar 32 is attached. The suspension structure 2 is then lowered through an access opening 50 with the platform assembly 4 in the stowed position. The collar 32 is then engaged with the suspension structure 2 by insertion of a pin or bolt through the required rungs 21 and corresponding holes provided in the collar 32. Stabiliser arms 30 may then be engaged with the collar 32 to support the access apparatus 1 suspended through the access opening 50. A user can then climb through the opening collar opening 33 and down the rungs 21 towards the fixed platform 42, then deploy the platform assembly 4 by unlocking it

from the stowed position, rotating the second platforms 41 outwardly to be substantially planar with the first platform 40 adjacent the suspension structure 2, then rotating the first and second platforms 40 and 41 to the substantially horizontal working position and locking the platform structure in position using the locking mechanism 48. Barrier posts 46 including a safety rope 47 may then be inserted in the holes provided about the perimeter of the platform assembly 4.

The user then has a safe and stable working platform from which a boat may be inflated and deployed, if required. As the depth at which the platform assembly 4 is suspended within the reservoir may be selected, it may not be necessary to raise the water level for inspection of the ceiling of the reservoir. If it is necessary, the above process may be reversed and the apparatus 1 extracted to avoid submersion and corrosion of the apparatus, if desired.

Preferably the access apparatus 1 is substantially formed from a strong yet lightweight material, such as aluminium, allowing the apparatus to be deployed by hand by one or more users.

From the foregoing it will be seen that a vertically suspended access apparatus is provided which has the benefits of providing safer and easier access to an internal void or underlying space. Additionally, the platform may be collapsed and dismantled for transportation and installation or storage elsewhere, providing an economical alternative to installing permanent internal walkways in a covered or underground reservoir which would be susceptible to corrosion and difficult to maintain and inspect.

Although this invention has been described by way of example and with reference to possible embodiments thereof, it is to be understood that modifications or improvements may be made thereto without departing from the scope of the invention. Furthermore, where reference has been made to specific components or integers of the invention having known equivalents, then such equivalents are herein incorporated as if individually set forth.

Unless the context clearly requires otherwise, throughout the description, the words "comprise", "comprising", and the like, are to be construed in an inclusive sense as

opposed to an exclusive or exhaustive sense, that is to say, in the sense of "including, but not limited to".

5 Any discussion of the prior art throughout the specification should in no way be considered as an admission that such prior art is widely known or forms part of common general knowledge in the field.

Claims

1. An access apparatus having a suspension structure, a support structure adapted to suspend said suspension structure through an access opening, and a platform assembly, the platform assembly comprising a platform structure moveable between a stowed position substantially adjacent said suspension structure and a working position extending outwardly from said suspension structure.
2. An access apparatus as claimed in claim 1 wherein said moveable platform structure consists of a first platform pivotally mounted on said suspension structure for pivotal movement between said stowed and working positions.
3. An access apparatus as claimed in claim 1 or claim 2, wherein the platform assembly also includes a fixed platform on the suspension structure substantially planar with said platform structure when in the working position.
4. An access apparatus as claimed in claim 2 wherein said moveable platform structure includes one or more second platforms each movable about two independent axes for movement between said stowed and working positions.
5. An access apparatus as claimed in claim 4 wherein the or each second platform is pivotally mounted to said first platform, whereby the or each second platform is pivotable with respect to both the first platform and the suspension structure for movement between the stowed and working positions.
6. An access apparatus as claimed in any one of the preceding claims, wherein the access apparatus includes a locking mechanism, whereby the moveable platform structure may be locked in place in the working position to prevent the platform structure pivoting inadvertently.
7. An access apparatus as claimed in claim 2 wherein the first platform has a width substantially equal to that of the suspension structure, thereby minimising overhang in the stowed position.
8. An access apparatus as claimed in claim 4 wherein the or each second platform has a width substantially equal to or less than that of the corresponding adjacent sides of said

suspension structure when in the stowed position, thereby minimising overhang in the stowed position.

9. An access apparatus as claimed in any one of the preceding claims, wherein said platform structure is supported by at least one propping means, said propping means being sufficient to support the weight of at least one human upon the platform assembly when in its working position.
10. An access apparatus as claimed in claim 9 wherein said propping means consists of one or more extensible telescopic rods movably mounted to said suspension structure and to said platform structure at opposing ends.
11. An access apparatus as claimed in claim 10 wherein the or each telescopic rod is moveably mounted such that the platform structure is permitted to move between the stowed and working positions.
12. An access apparatus as claimed in any one claims 9 to 11, wherein the or each telescopic rod is mounted to said suspension structure by way of coupling with a fulcrum protruding therefrom.
13. An access apparatus as claimed in any one of claims 9 to 12, wherein the or each telescopic rod is moveably mounted to said platform structure by way of coupling with a fulcrum protruding therefrom.
14. An access apparatus as claimed in claim 12 or claim 13, wherein said fulcrums protrude at an angle substantially coaxial with said telescopic rod when in the working position.
15. An access apparatus as claimed in any one of claims 12 to 14, wherein said fulcrums protrude to the extent that said platform structure is permitted to pivot through an angle substantially equal to 90°.
16. An access apparatus as claimed in any one of the preceding claims, wherein said platform structure is supported by four telescopic rods coupled to the suspension structure by way of two protruding suspension fulcrums provided on adjacent corners of said suspension structure, each fulcrum being provided with two couplings, at least one coupling permitting movement of the corresponding rod in three dimensions, and

coupled to the platform structure by way of four protruding platform fulcrums, two of said platform fulcrums being provided on the outer corners of the first platform, and one platform fulcrum permitting movement of the corresponding rod in three dimensions being provided on each of the second platforms, whereby said first platform is pivotable upwardly relative to said suspension structure, and said second platforms are pivotable about two axes between the working and stowed positions.

17. An access apparatus as claimed in any one of the preceding claims, wherein the platform assembly includes at least one grating panel adapted to provide a substantially planar surface when said platform is in the working position.
18. An access apparatus as claimed in any one of the preceding claims, wherein the suspension structure consists of a framework including a plurality of spaced-apart substantially horizontal rungs at fixed intervals on at least one side of the suspension structure, thereby forming a ladder to provide human access between the first and second ends of the suspension structure when substantially vertical.
19. An access apparatus as claimed in any one of the preceding claims, wherein said rungs are provided on two opposing sides of said suspension structure.
20. An access apparatus as claimed in claim 18 or claim 19, wherein the framework includes bracing members on at least one side of the suspension structure to improve torsional rigidity of the suspension structure.
21. An access apparatus as claimed in any one claims 18 to 20, wherein said framework includes a base frame member provided at or adjacent an end of said suspension structure.
22. An access apparatus as claimed in any one of claims 18 to 21, wherein said framework consists of two opposing ladders secured together by said bracing and said base frame member.
23. An access apparatus as claimed in any one claims 18 to 22, wherein the framework permits a human to climb the ladder internally with respect to said framework.

24. An access apparatus as claimed in any one of the preceding claims, wherein at least a portion of one side of the suspension structure is substantially open, said side being adjacent said platform assembly when in the stowed position.
25. An access apparatus as claimed in any one of the preceding claims, wherein the support structure consists of a plurality of stabiliser arms extending substantially radially from said suspension structure.
26. An access apparatus as claimed in claim 25, wherein said stabiliser arms are provided with adjustable feet at their distal ends, whereby the suspension apparatus may be adapted for use on an uneven surface.
27. An access apparatus as claimed in claim 25 or claim 26, wherein the support structure includes a collar adapted to be provided about said suspension structure, thereby providing an opening for access through the collar and suspension structure, and further adapted to engage with said plurality of stabiliser arms and said suspension structure.
28. An access apparatus as claimed in claim 27 wherein the collar is adapted to engage with said suspension structure in any one of two or more positions along the length of the suspension structure, thereby providing for suspension of the platform assembly at multiple depths.
29. An access apparatus as claimed in claim 27 or claim 28, wherein the collar is adapted to engage with said suspension structure via a bolt or pin inserted through a pair of opposing rungs of said suspension structure.
30. An access apparatus substantially as herein described with reference to Figures 1 to 7 of the accompanying drawings.

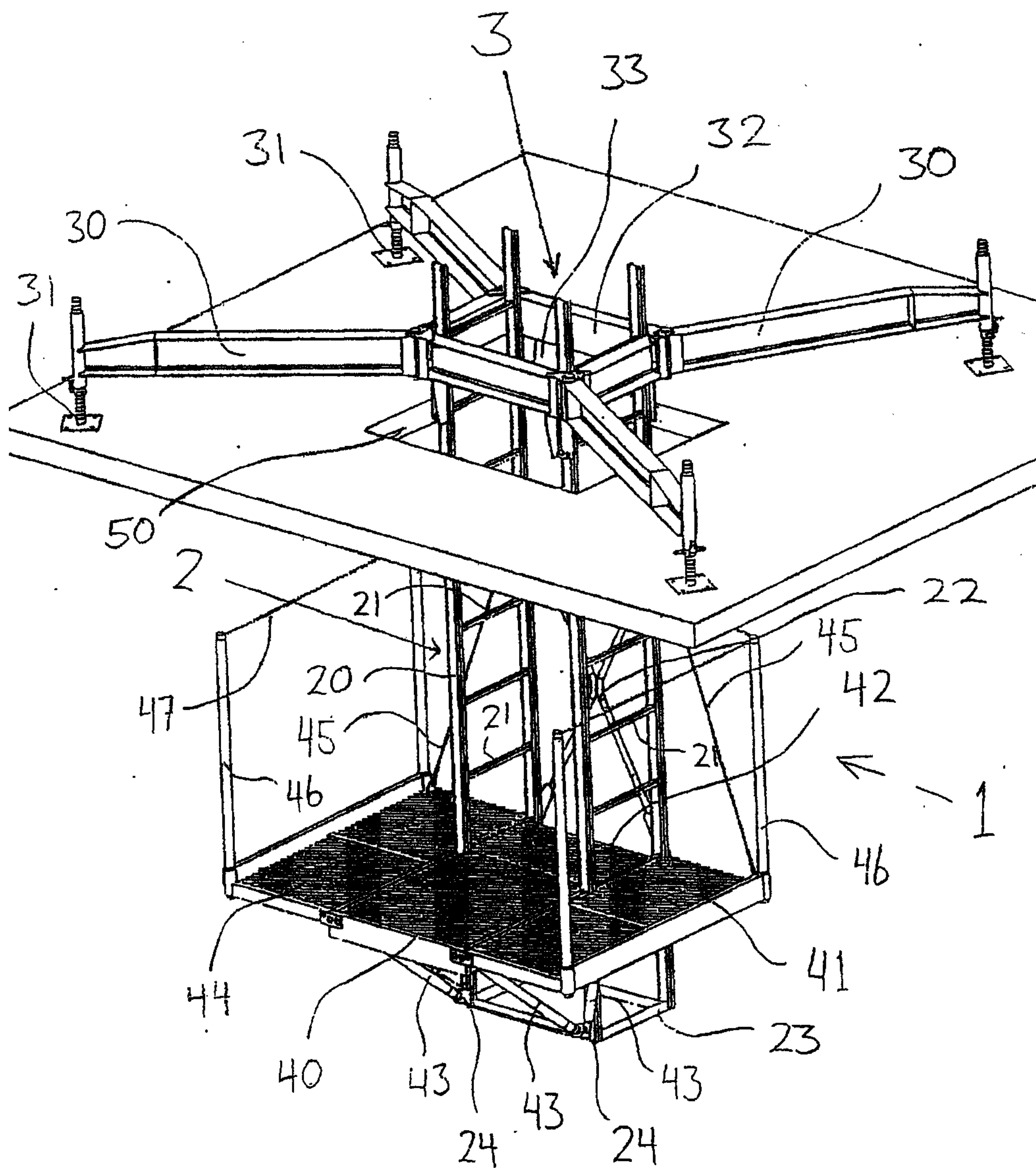


FIG. 1

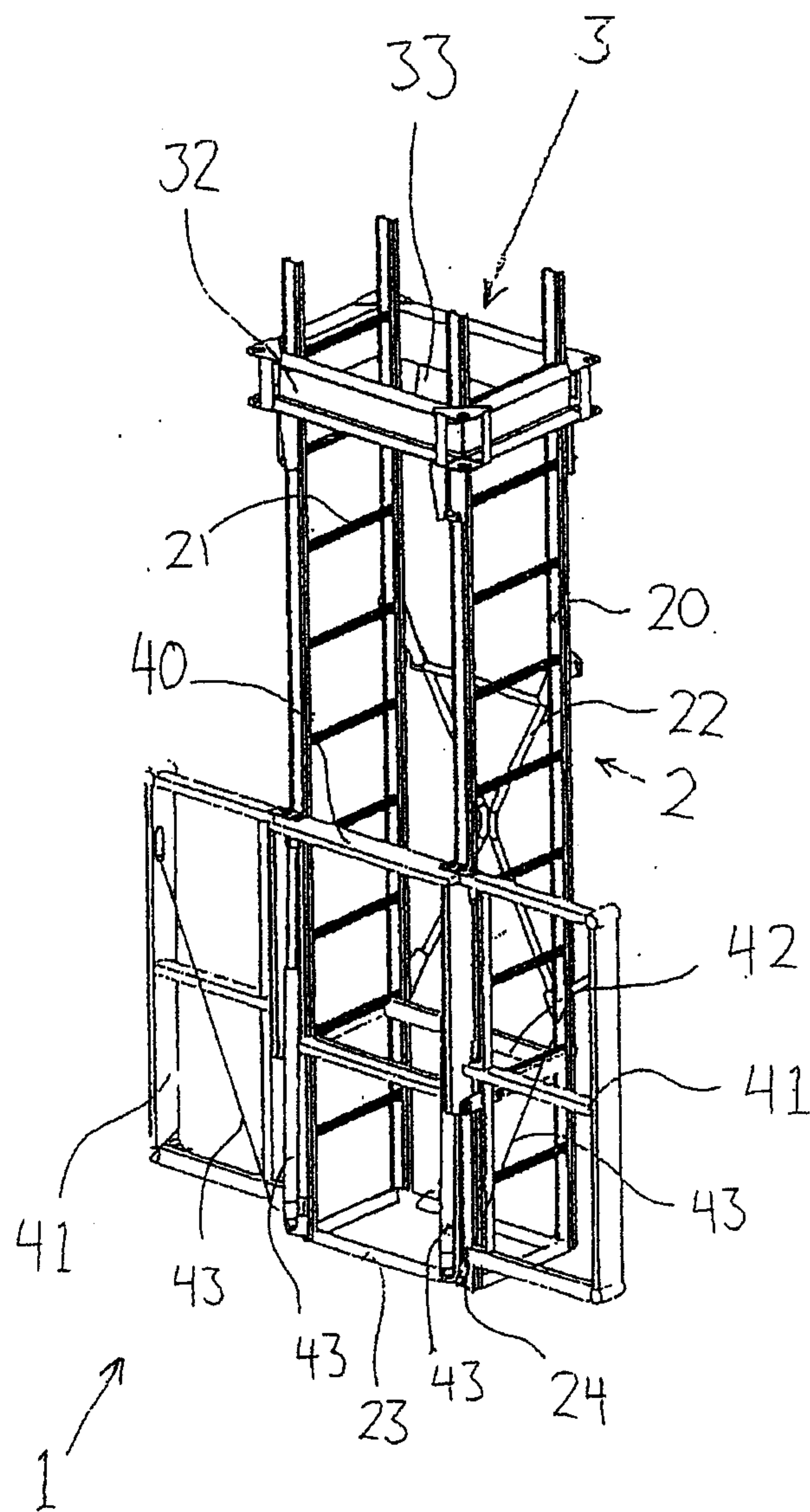


FIG. 2

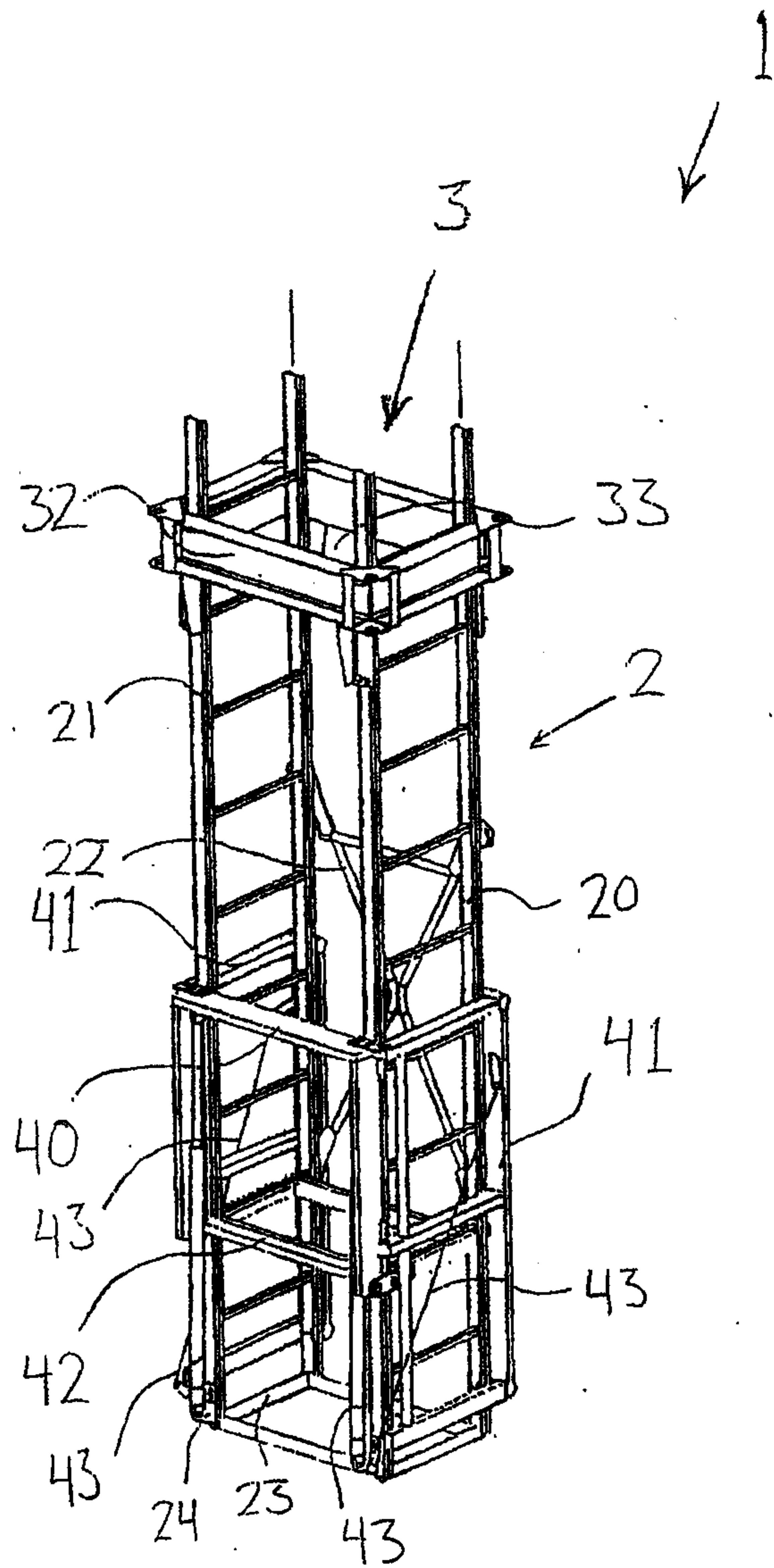


FIG. 3

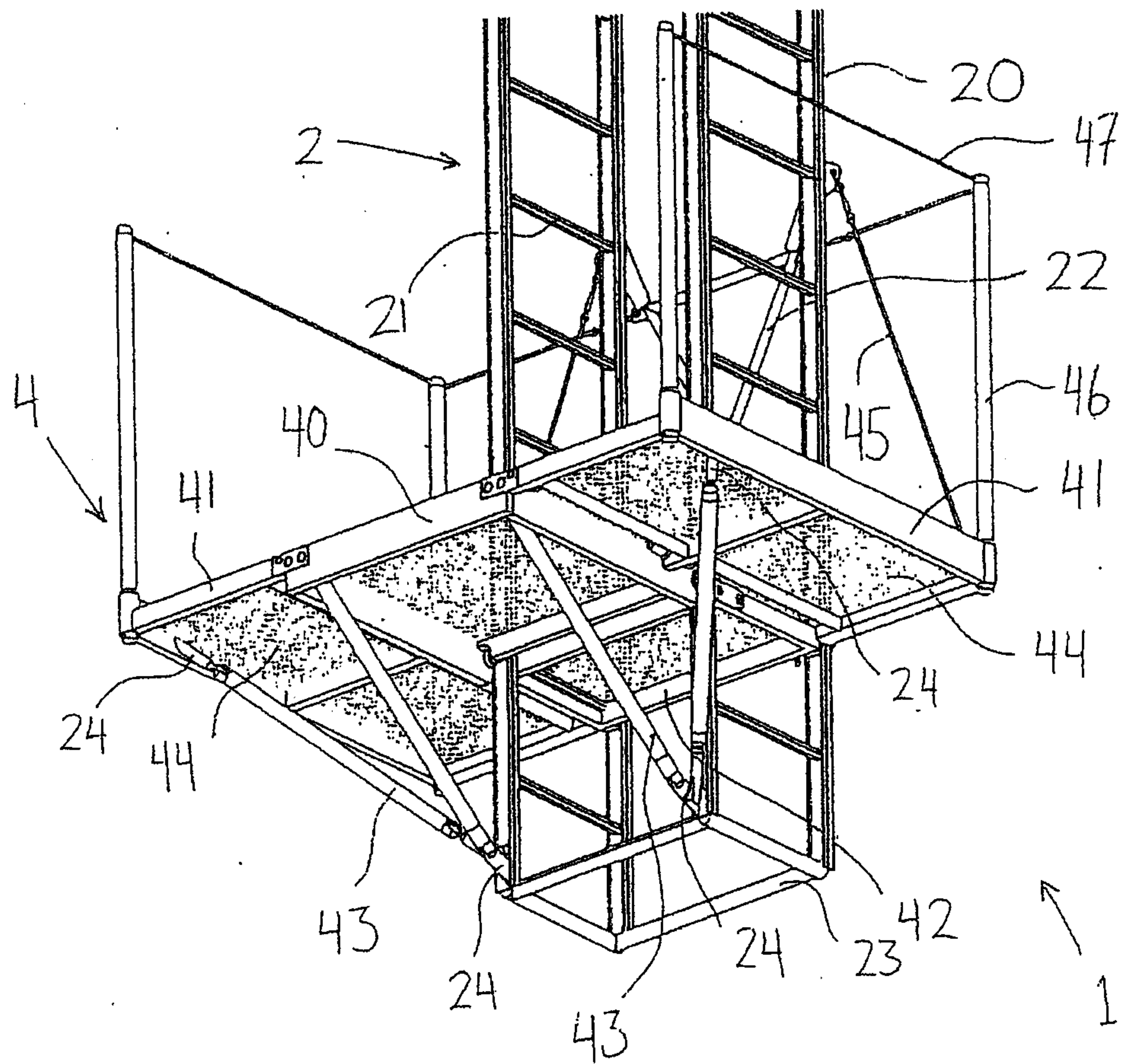


FIG 4

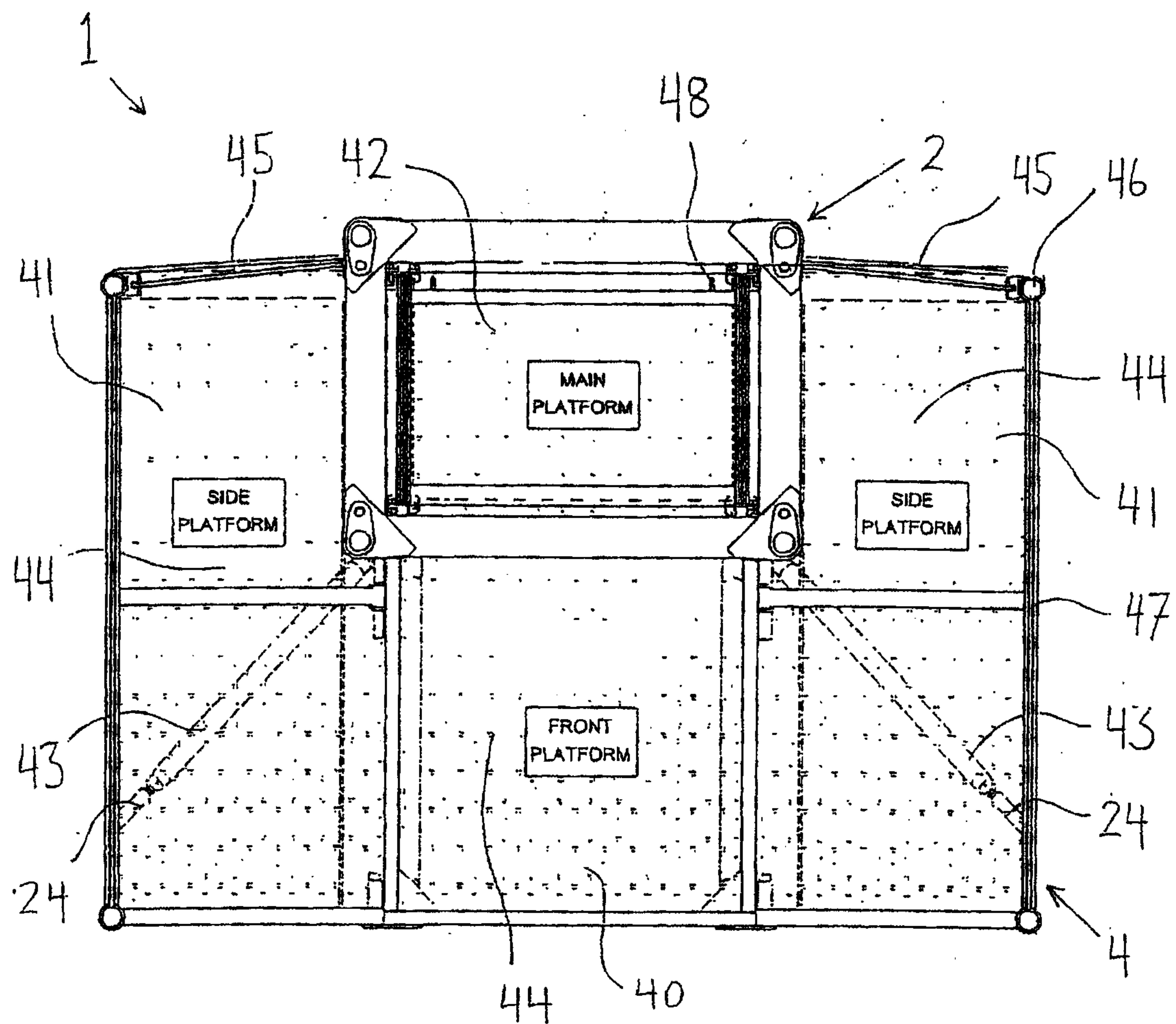


FIG 5

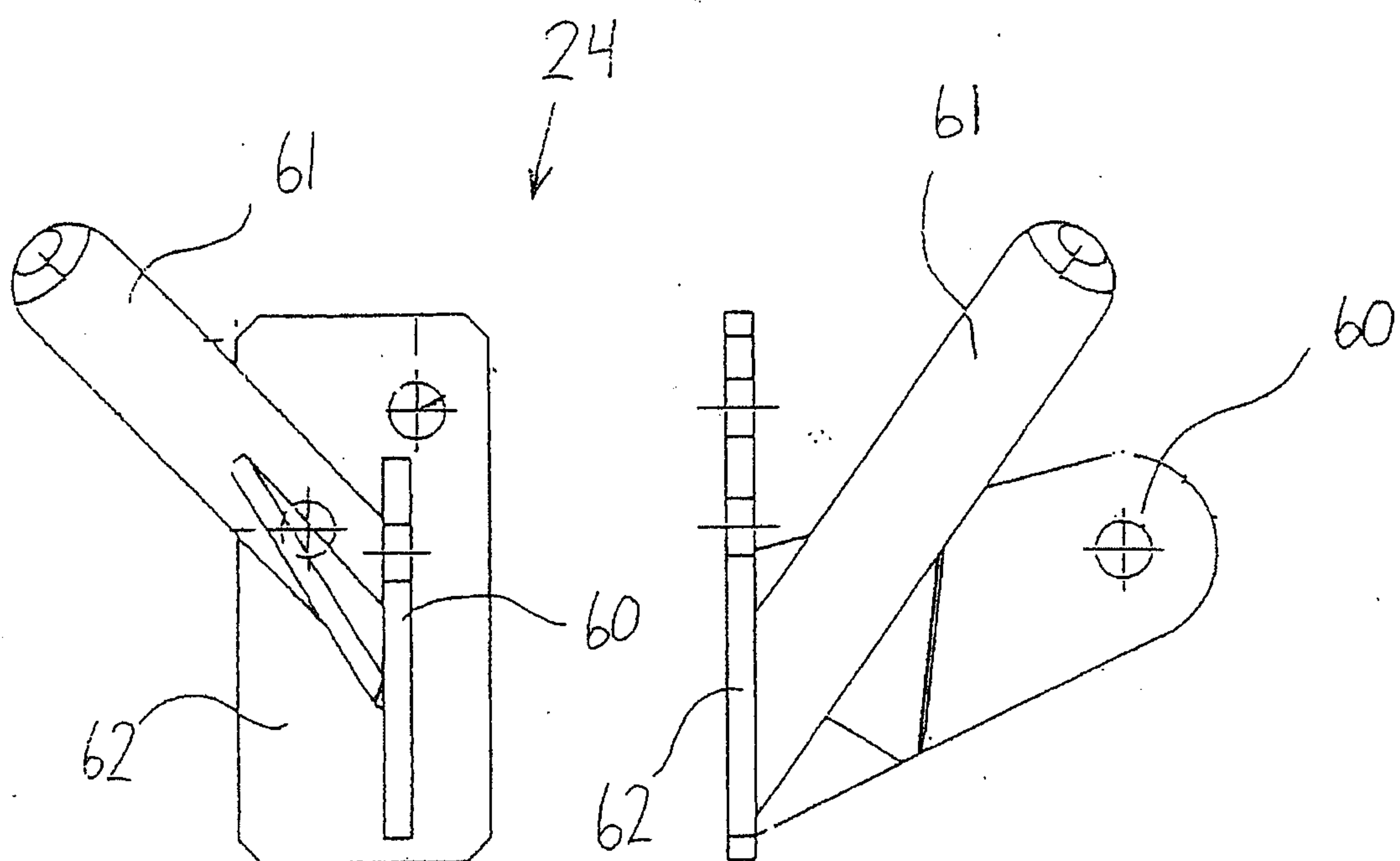


FIG. 6

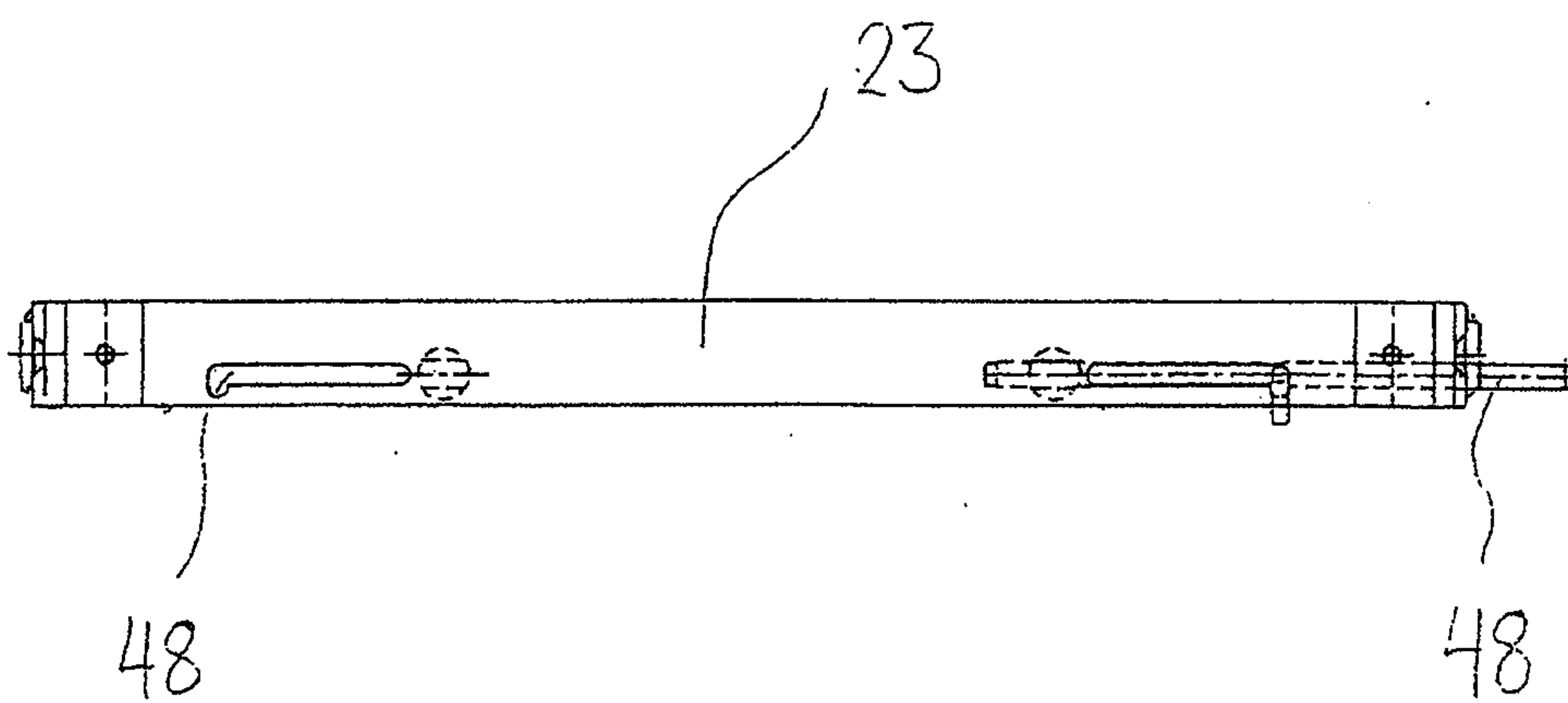


FIG. 7

