

(22) Date de dépôt/Filing Date: 2000/08/17

(41) Mise à la disp. pub./Open to Public Insp.: 2001/04/28

(45) Date de délivrance/Issue Date: 2004/05/25

(51) Cl.Int.⁷/Int.Cl.⁷ G01F 23/42

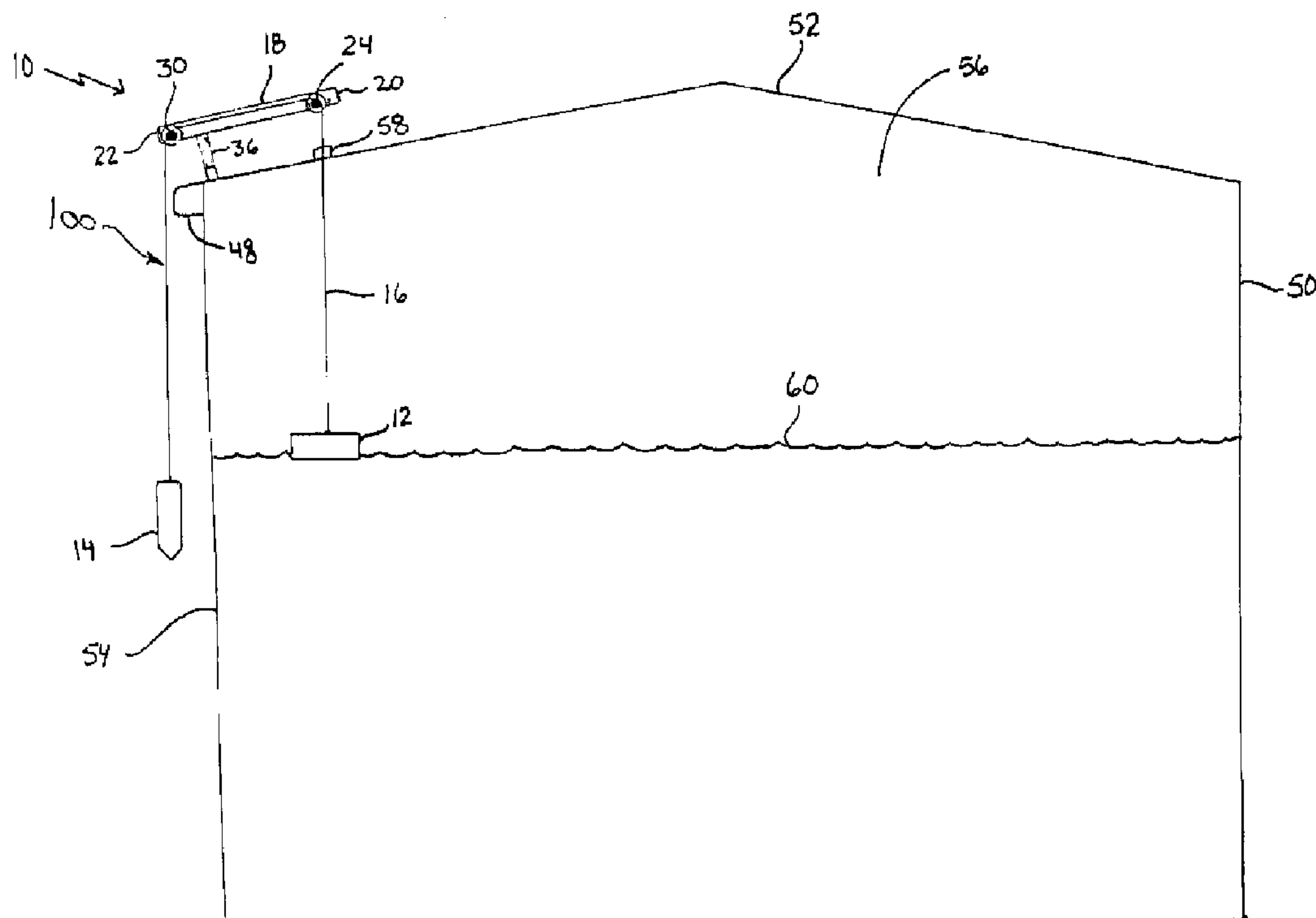
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(54) Titre : PORTE-CABLE POUR JAUGE DE RESERVOIR MUNIE D'UN FLOTTEUR ET D'UN INDICATEUR DE NIVEAU RELIES PAR UN CABLE

(54) Title: CABLE SUPPORT FOR TANK GAUGE HAVING FLOAT AND LEVEL INDICATOR CONNECTED BY A CABLE



(57) **Abrégé/Abstract:**

A cable support for a tank gauge having a float and a level indicator connected by a cable. The cable support includes an elongate support arm having a first end and a second end. A first pulley is mounted at the first end of the support arm. A second pulley is mounted at the second end of the support arm. A support post is provided for supporting the support arm. The support post has a first end and a second end. The first end engages the support arm. A mounting bracket is positioned at the second end of the support post.

ABSTRACT OF THE DISCLOSURE

A cable support for a tank gauge having a float and a level indicator connected by a cable. The cable support includes an elongate support arm having a first end and a second end. A first pulley is mounted at the first end of the support arm. A second pulley is mounted at the second end of the support arm. A support post is provided for supporting the support arm. The support post has a first end and a second end. The first end engages the support arm. A mounting bracket is positioned at the second end of the support post.

&TITLE OF THE INVENTION:

Cable Support For Tank Gauge Having Float And Level Indicator Connected By A Cable

5 FIELD OF THE INVENTION

The present invention relates to a cable support for a tank gauge having a float and a level indicator connected by a cable.

10 BACKGROUND OF THE INVENTION

A common form of tank gauge has a float floating upon liquid within the tank, a level indicator suspended along the exterior sidewall of the tank and a cable of a fixed length connecting the float and the level indicator. As the liquid
15 level in the tank drops, the float falls and, due to the cable connection of a fixed length, the level indicator is pulled up the exterior sidewall of the tank. As the liquid level rises in the tank, the float rises with the liquid and, due to the fact that the level indicator is suspended on the cable of a
20 fixed length, the level indicator drops down the exterior sidewall of the tank. The level indicator can be used either with or without a scale that provides a precise measurement as to the quantity of liquid.

25 The tank gauge can not operate properly unless the cable can move freely. If the cable becomes caught, the level indicator will no longer "track" the positioning of the float and a false reading will be given. For this reason, direction altering pulleys are used to guide the cable as it exits
30 through a pipe in a top of the tank and as it bends to pass down the exterior sidewall of the tank. For convenience of installation the pulleys are mounted on a support arm. In order to ensure proper alignment as the cable exits the tank, it has been the practise in the industry to weld or otherwise secure
35 the support arm to the pipe through which the cable passes from the tank. However, problems have been encountered during cold weather as steam rising from the tank tends to condense and

freeze the cable onto the pulleys.

SUMMARY OF THE INVENTION

What is required is a cable support that will not be as
5 prone to freezing.

According to the present invention there is provided a cable support for a tank gauge having a float and a level indicator connected by a cable. The cable support includes an
10 elongate support arm having a first end and a second end. A first pulley is mounted at the first end of the support arm. A second pulley is mounted at the second end of the support arm. A support post is provided for supporting the support arm. The support post has a first end and a second end. The
15 first end engages the support arm. A mounting bracket is positioned at the second end of the support post.

The cable support, as described above is capable of supporting a cable for a tank gauge in a proper orientation
20 without the necessity to securing the support arm to the outlet pipe from the tank. The support arm is supported by the support post so that the first pulley can be positioned above the outlet pipe. Steam released through the outlet pipe is dissipated by the wind prior to reaching the first pulley, so
25 that icing of the pulley does not occur.

Although beneficial results may be obtained through the use of the cable support, as described above, not all tanks have the same dimensions, nor are the outlet pipes always
30 positioned in the same location. It is, therefore, desirable that the cable support be capable of being adapted to fit different installation requirements. If the cable support can not be adapted, there would be a requirement to maintain an inventory of a number of cable supports of differing sizes to
35 meet differing installation requirements. Even more beneficial results may, therefore, be obtained when either the first pulley, the second pulley or both pulleys are selectively

positionable along the axis of the support arm. This can be done in a number of ways. Beneficial results have been obtained by placing axially extending slots where each pulley is mounted to the support arm. Clamps are provided to clamp
5 each pulley in a selected axial position along the slot.

Although beneficial results may be obtained through the use of the cable support, as described above, the outlet pipes in the top of the tanks are sometimes at different heights.
10 It is, therefore, preferred that the support post be positioned adjacent the second end of the support arm and that the first end of the support arm extend at an upwardly inclined angle away from the support post. This provides additional clearance to clear the outlet pipe of the tank.

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Although beneficial results may be obtained through the use of the cable support, as described above, even more beneficial results may be obtained when the support post is telescopically extendible to adjust the height at which the
20 support arm is positioned. With a telescopically adjustable support post, one can be certain that the support arm can be positioned at a consistent height above the outlet pipe of the tank. It has been found that a height of approximately 12 inches is more than sufficient to avoid any freezing problems.

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BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the invention will become more apparent from the following description in which reference is
30 made to the appended drawings, the drawings are for the purpose of illustration only and are not intended to in any way limit the scope of the invention to the particular embodiment or embodiments shown, wherein:

FIGURE 1 is a side elevation view, partially in section,
35 of a cable support constructed in accordance with the teachings of the present invention positioned on a tank and supporting a cable from a tank gauge.

FIGURE 2 is a side elevation view of the cable support illustrated in **FIGURE 1**.

FIGURE 3 is a detailed perspective view of the pulley attachment to the support arm of the cable support illustrated in **FIGURE 1**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment, a cable support for a tank gauge having a float and a level indicator connected by a cable generally identified by reference numeral 10, will now be described with reference to **FIGURES 1** through **3**.

Structure and Relationship of Parts:

Referring to **FIGURE 1**, there is illustrated a tank gauge, generally indicated by reference numeral 100. Tank gauge 100 includes float 12 and a level indicator 14 connected by a cable 16. Cable 16 is supported by cable support 10 which includes an elongate support arm 18. Referring to **FIGURE 2**, elongate support arm 18 has a first end 20, a second end 22 and an axis generally indicated by reference numeral 23. A first pulley 24 is mounted at first end 20 of support arm 18 and can be selectively positioned along axis 23 of support arm 18. Support arm 18 has an axially extending first slot 26 which is adjacent to first end 20. Referring to **FIGURE 3**, a first clamp 28 is provided to clamp first pulley 24 in a selected axial position along first slot 26. Referring to **FIGURE 2**, a second pulley 30 is mounted at second end 22 of support arm 18 and can be selectively positionable along axis 23 of support arm 18. Support arm 18 also has an axially extending second slot 32 which is adjacent to second end 22. Referring to **FIGURE 3**, a second clamp 34 is provided to clamp second pulley 30 in a selected axial position along second slot 32.

Referring to **FIGURE 2**, a support post 36 is provided for supporting support arm 18. Support post 36 has a first end 38 and a second end 40. First end 38 of support post 36 is connected to support arm 18. Support post 36 is positioned

adjacent to second end 22 of support arm 18 while first end 20 of support arm 18 extends at an inclined angle away from support post 36. Support post 36 is telescopically extendible for adjustment of the height at which support arm 18 is to be positioned. Support post 36 has a first member 42 and a second member 44. A clamp 46 is provided for clamping first member 42 and second member 44 in a selected telescopic position. A mounting bracket 48 is positioned at second end 40 of support post 36.

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Operation:

The use and operation of cable support 10 will now be described with reference to **FIGURES 1** through **3**. Referring to **FIGURE 1**, there is provided a tank 50 which has a top 52, an exterior sidewall 54 and an interior 56. An outlet pipe 58 extends up through top 52 of tank 50. Tank gauge 100, including float 12 and level indicator 14 connected by cable 16, is installed on tank 50. Cable 16 that extends between float 12 and level indicator 14 is of a fixed length. Float 12 floats on liquid 60 contained within interior 56 of tank 50 while level indicator 14 is suspended by cable 16 down exterior sidewall 54 of tank 50. Cable support 10 is used to ensure that cable 16 can move freely so that level indicator 14 always accurately tracks the positioning of float 12.

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Referring to **FIGURE 2**, mounting bracket 48 is mounted to top 52 or exterior sidewall 54 of tank 50 so that support arm 18 is supported by support post 36 with first pulley 24 in an elevated position above outlet pipe 58 and second pulley 30 is positioned in an elevated position in substantial alignment with exterior sidewall 54. In order to obtain the desired alignment of first pulley 24 and second pulley 26, first pulley 24 and second pulley 30 are repositioned along axis 23 of support arm 18. Referring to **FIGURE 3**, adjustment of the position of first pulley 24 is accomplished loosening the clamping force of first clamp 28. By loosening the clamping force, first pulley 24 can be moved to any suitable position

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along axially extending first slot 26. First pulley 24 can be secured in the selected position by turning first clamp 28 so as to exert the clamping force upon support arm 18. Referring to **FIGURE 1**, ideally, first pulley 24 will be positioned above outlet pipe 58, so that cable 16 can extend directly down from first pulley 24 through outlet pipe 58 and into interior 56 of tank 50. If necessary, position of second pulley 30 can also be adjusted in the similar fashion along axially extending second slot 32. When a desired position is achieved, second pulley 30 is secured in position along second slot 32 by second clamp 34. Second clamp 34 operates in the same manner as first clamp 28. It will also be appreciated that while first clamp 28 and second clamp 34 are illustrated as being keys, other means can be used to clamp first pulley 24 and second pulley 30 in position.

Referring to **FIGURE 2**, cable support 10 for a tank gauge 100 is capable of maintaining cable 16 in proper orientation without the necessity of securing support arm 18 to outlet pipe 58 of tank 50. Because support arm 18 is not secured to outlet pipe 58 of tank 50, the height at which support arm 18 is positioned above top 52 of tank 50 can be modified. The ability to adjust cable support 10 is beneficial because tanks 50 come in a variety of dimensions. Furthermore, outlet pipes 58 come in a variety of heights, and are installed on tops 52 of tanks 50 which have varying degrees of inclines. It is beneficial that support post 36 be adjustable so as to enable positioning of support arm 18 to accommodate variations in heights of outlet pipes 58 and differences in inclines of tops 52 of tanks 50. Referring to **FIGURE 2**, telescopic adjustable support post 36 can be adjusted so that support arm 18 is positioned at a consistent height above outlet pipe 58 of tank 50. First member 42 of support post 36 is engaged to top 52 of tank while second member 44 of support post 36 is engaged to support arm 18. Height of support post 36 is adjusted by moving second member 44 relative to first member 42. When the desired height for support post 36 is achieved, position of

second member 44 relative to first member 42 is secured by clamp 46. In the illustrated embodiment clamp 28 is depicted as being a key that extends through first member 42 and when turned will exert a clamping force on second member 44 to
5 secure second member 44 in place relative to first member 42. It will be noted that other clamping means can be used in place of key.

Although support arm 18 can be positioned at any height
10 permitted by support post 36, it has been found that when support arm 18 is positioned approximately twelve inches above outlet pipe 58, problems with freezing during cold weather can be avoided. At the height of twelve inches, condensation and steam escaping from outlet which can cause cable 16 to freeze
15 onto first pulley 24 is dissipated by wind prior to inhibiting the free movement of cable 16 along first pulley 24 and second pulley 30.

Referring to **FIGURE 1**, cable 16 is installed so that cable
20 16 extends from float 12 located in interior 56 of tank 50 up and out of outlet pipe 58 then over first pulley 24 and over second pulley 30 and then down exterior sidewall 54 of tank 50 to level indicator 14. As the level of liquid 60 in tank 50 drops, float 12 falls along with the level of liquid 60. Cable
25 16 is of a fixed length so that as float 12 falls, float 12 pulls cable 16 through first pulley 24 and second pulley 30 and pulls level indicator 14 up exterior sidewall 54 of tank 50. Conversely, when the level of liquid 60 in tank 50 rises, float 12 rises with liquid 60, and level indicator 14 drops down
30 exterior sidewall 54 of tank 50. The height at which level indicator 14 is suspended along exterior sidewall 54 is indicative of the level of liquid 60 contained within tank 50. Level indicator 14 that is suspended at a low level along sidewall 54 indicates that there is a higher level of liquid
35 60 in tank 50, while a level indicator 14 that is suspended along sidewall 54 closer to top 52 of tank 50 would indicate that the level of liquid 60 is quite low in tank 50. Level

indicator 14 may be used in conjunction with a scale to provide a more precise measurement of the amount of liquid 60 contained within tank 50.

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In this patent document, the word "comprising" is used in its non-limiting sense to mean that items following the word are included, but items not specifically mentioned are not excluded. A reference to an element by the indefinite article
10 "a" does not exclude the possibility that more than one of the element is present, unless the context clearly requires that there be one and only one of the elements.

It will be apparent to one skilled in the art that
15 modifications may be made to the illustrated embodiment without departing from the spirit and scope of the invention as hereinafter defined in the Claims.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

- 5 1. A cable support for a tank gauge having a float and a level indicator connected by a cable, comprising:
an elongate support arm having a first end and a second end;
a first pulley mounted at the first end;
10 a second pulley mounted at the second end;
a support post for supporting the support arm, the support post having a first end and a second end, the first end engaging the support arm; and
a mounting bracket positioned at the second end of the
15 support post.
2. The cable support as defined in Claim 1, wherein the support post is positioned adjacent the second end of the support arm and the first end of the support arm extends at an
20 upwardly inclined angle away from the support post.
3. The cable support as defined in Claim 1, wherein the first pulley is selectively positionable along the axis of the support arm.
25
4. The cable support as defined in Claim 1, wherein the second pulley is selectively positionable along the axis of the support arm.
- 30 5. The cable support as defined in Claim 3, wherein the support arm has an axially extending first slot adjacent to the first end, a first clamp being provided to clamp the first pulley in a selected axial position along the first slot.
- 35 6. The cable support as defined in Claim 4, wherein the support arm has an axially extending second slot adjacent to the second end, a second clamp being provided to clamp the second pulley in a selected axial position along the second

slot.

7. The cable support as defined in Claim 1, wherein the support post is telescopically extendible to adjust the height
5 at which the support arm is positioned.

8. The cable support as defined in Claim 7, wherein the support post includes a first member, a second member, and a clamp for clamping the first member and the second member in
10 a selected telescopic position.

9. A cable support for a tank gauge having a float and a level indicator connected by a cable, comprising:

an elongate support arm having a first end and a second
5 end;

a first pulley mounted at the first end of the support arm and selectively positionable along the axis of the support arm, the support arm having an axially extending first slot adjacent to the first end, a first clamp being provided to clamp the
10 first pulley in a selected axial position along the first slot;

a second pulley mounted at the second end of the support arm and selectively positionable along the axis of the support arm, the support arm having an axially extending second slot adjacent to the second end, a second clamp being provided to
15 clamp the second pulley in a selected axial position along the second slot;

a support post for supporting the support arm, the support post having a first end and a second end, the first end engaging the support arm, the support post is positioned
20 adjacent the second end of the support arm and the first end of the support arm extends at an upwardly inclined angle away from the support post, the support post being telescopically extendible to adjust the height at which the support arm is positioned, the support post including a first member, a second
25 member, and a clamp for clamping the first member and the second member in a selected telescopic position; and

a mounting bracket positioned at the second end of the support post.

10. A cable support comprising in combination:

a tank having a top, an exterior sidewall and an interior,
an outlet pipe extending up through the top of the tank;

5 a tank gauge having a float and a level indicator
connected by a cable;

the float floating on liquid within the interior of the
tank;

the level indicator being suspended by the cable down the
10 exterior sidewall of the tank;

an elongate support arm having a first end and a second
end;

a first pulley mounted at the first end;

a second pulley mounted at the second end;

15 a support post for supporting the support arm, the support
post having a first end and a second end, the first end
engaging the support arm;

a mounting bracket positioned at the second end of the
support post;

20 the mounting bracket being mounted to one of the top and
the exterior sidewall of the tank with the support arm being
supported by the support post to position the first pulley in
an elevated position above the outlet pipe and the second
pulley in an elevated position substantially in alignment with
25 the exterior sidewall; and

the cable extending from the float in the interior of the
tank, out the outlet pipe, over the first pulley, over the
second pulley and down the exterior sidewall of the tank to the
level indicator.

30

11. The cable support as defined in Claim 10, wherein the
support post is positioned adjacent the second end of the
support arm and the first end of the support arm extends at an
upwardly inclined angle away from the support post.

35

12. The cable support as defined in Claim 10, wherein the
first pulley is selectively positionable along the axis of the

support arm.

13. The cable support as defined in Claim 10, wherein the second pulley is selectively positionable along the axis of the support arm.
5

14. The cable support as defined in Claim 12, wherein the support arm has an axially extending first slot adjacent to the first end, a first clamp being provided to clamp the first pulley in a selected axial position along the first slot.
10

15. The cable support as defined in Claim 13, wherein the support arm has an axially extending second slot adjacent to the second end, a second clamp being provided to clamp the second pulley in a selected axial position along the second slot.
15

16. The cable support as defined in Claim 10, wherein the support post is telescopically extendible to adjust the height at which the support arm is positioned.
20

17. The cable support as defined in Claim 16, wherein the support post includes a first member, a second member, and a clamp for clamping the first member and the second member in a selected telescopic position.
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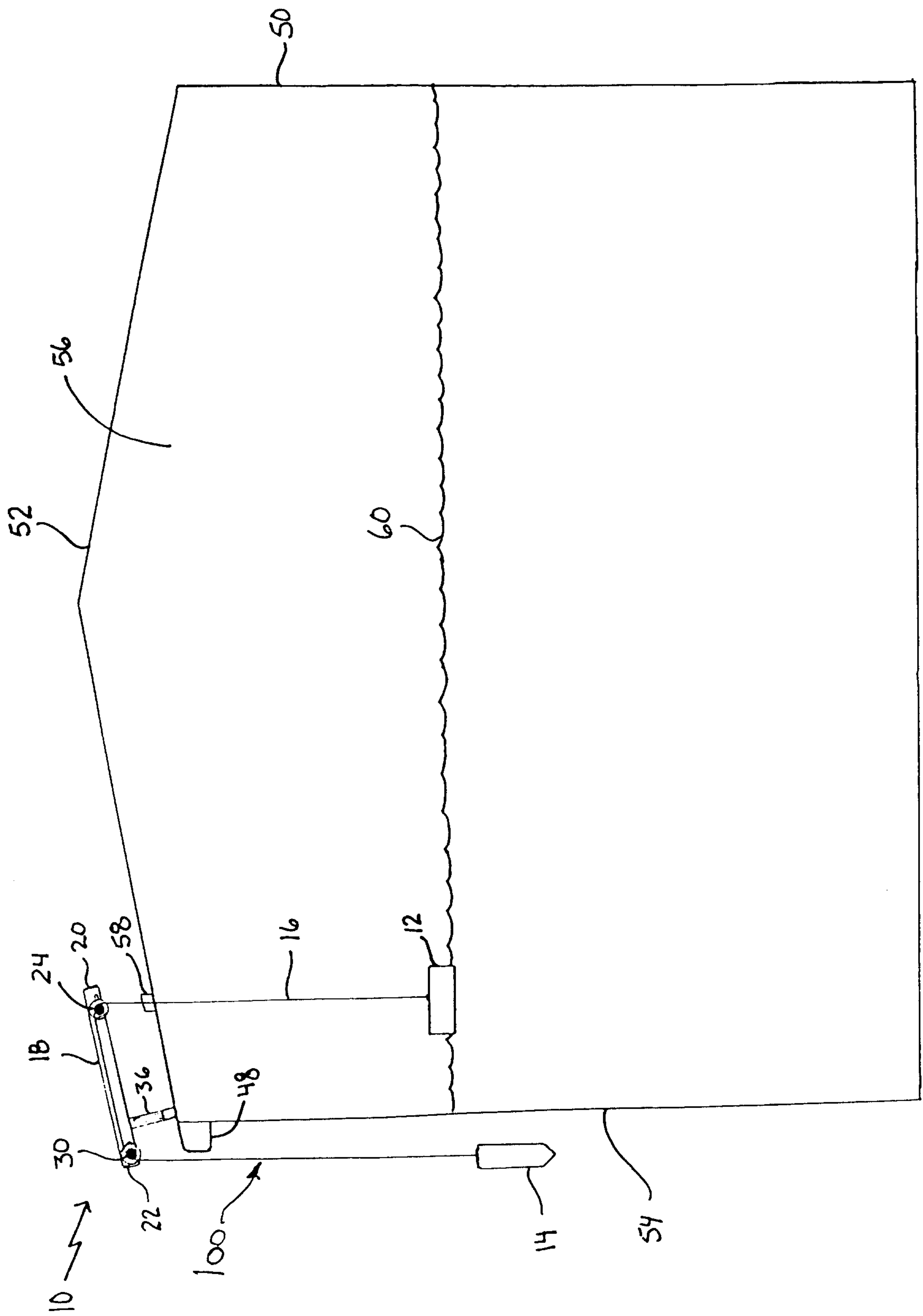


FIGURE 1

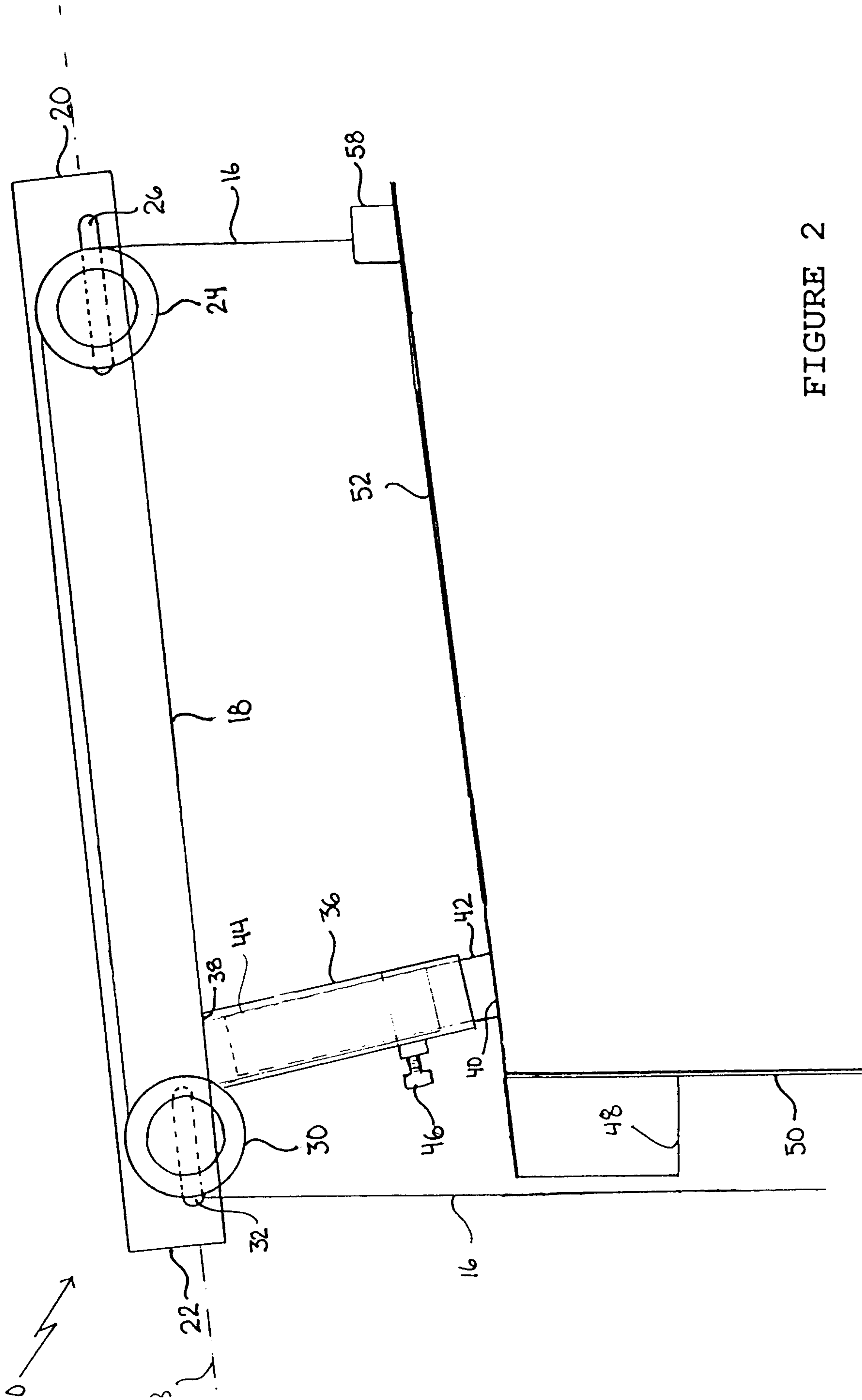


FIGURE 2

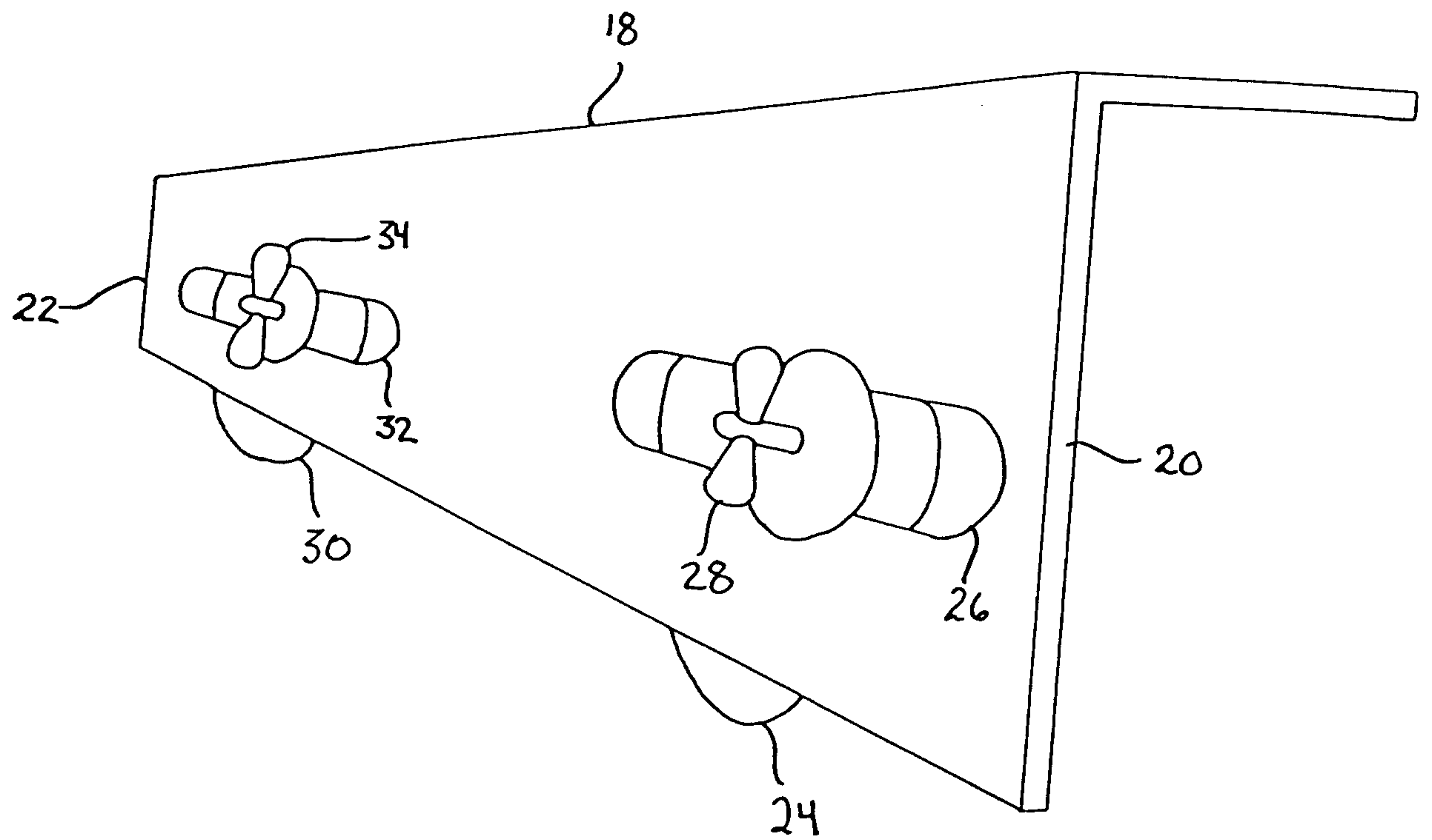


FIGURE 3

