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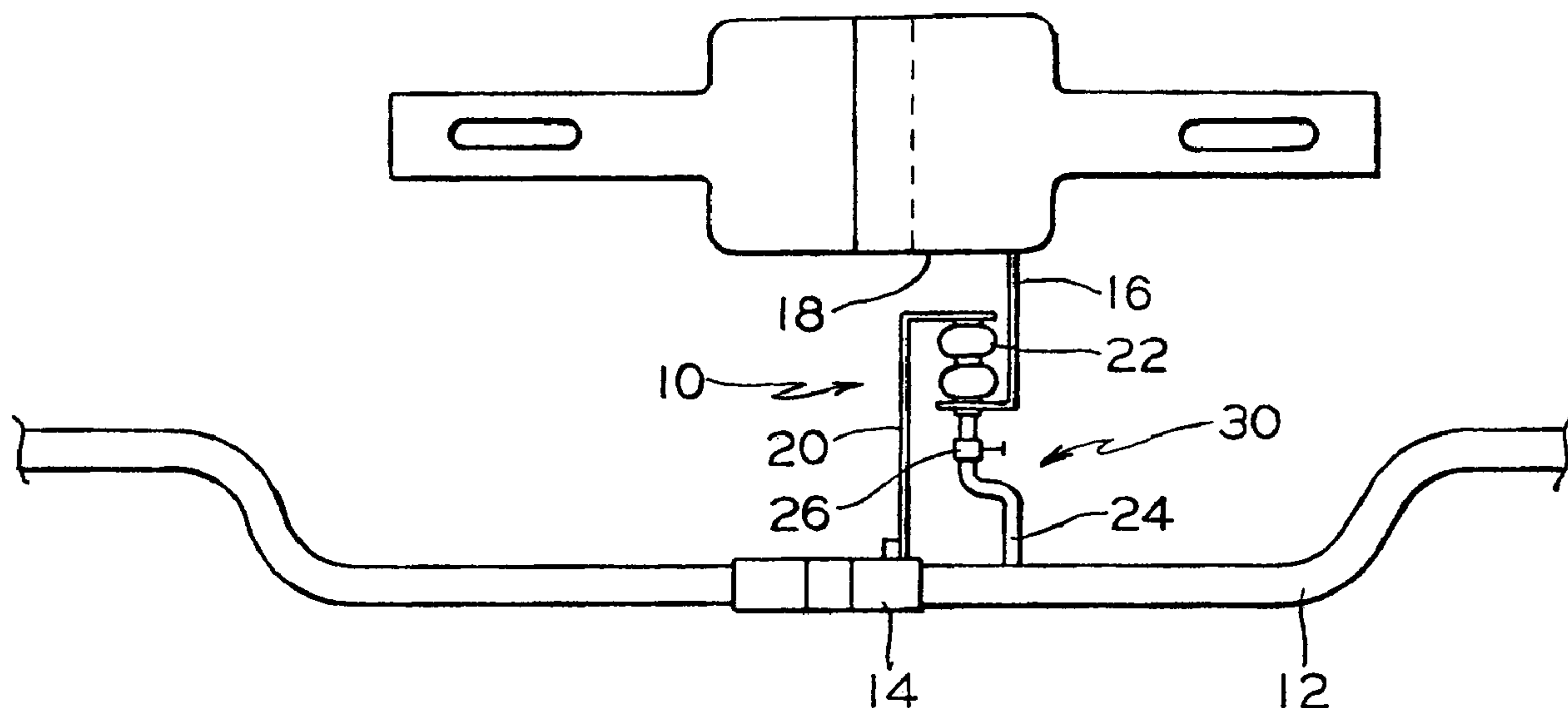
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(54) Titre : DISPOSITIF POUR SOULEVER UN TUYAU FLEXIBLE DE FREIN

(54) Title: BRAKE HOSE LIFTING APPARATUS



(57) Abrégé/Abstract:

An apparatus for lifting a brake hose including a glad hand secured to one end thereof. The brake hose to be lifted into an elevated position is attached to an end of a railway car. Such apparatus further maintains the brake hose in such elevated position during in track service. Such apparatus includes a first member engageable with a predetermined portion of such railway car and a second member engageable with one of such glad hand and such brake hose. There is at least one fluid pressure actuated expansion member disposed between and engageable with such first and second member. Additionally, a supply line having a choke is disposed in fluid communication with such at least one fluid pressure actuated expansion member and a source of fluid pressure for expanding the expansion member in a longitudinal direction and thereby raise such brake hoses to a predetermined elevated position.



ABSTRACT OF THE DISCLOSURE

An apparatus for lifting a brake hose including a glad hand secured to one end thereof. The brake hose to be lifted into an elevated position is attached to an end of a railway car. Such
5 apparatus further maintains the brake hose in such elevated position during in track service. Such apparatus includes a first member engageable with a predetermined portion of such railway car and a second member engageable with one of such glad hand and such brake hose. There is at least one fluid pressure
10 actuated expansion member disposed between and engageable with such first and second member. Additionally, a supply line having a choke is disposed in fluid communication with such at least one fluid pressure actuated expansion member and a source of fluid pressure for expanding the expansion member in a
15 longitudinal direction and thereby raise such brake hoses to a predetermined elevated position.

BRAKE HOSE LIFTING APPARATUS

5

FIELD OF THE INVENTION

The present invention relates, in general, to railway vehicle brake hoses and, more particularly, this invention relates to an apparatus for both lifting and maintaining such
10 brake hoses in an elevated position which position is at least sufficient to insure that the brake hoses will not be accidentally damaged during in track service of such railway vehicle.

BACKGROUND OF THE INVENTION

15 As is generally well known in the railway industry, the brake hoses of adjacently disposed railway cars are joined together in an air tight manner by glad hands for the purpose of supplying compressed air to the brake system.

Prior to the conception and development of the present
20 invention, as is equally well known in the railway industry, the vertical elevation of these brake hoses after being joined together at the gland hands is prone to misalignments thereby allowing the brake hoses to hang down freely towards the ground. Currently, it has been determined that a number of railroads are

experiencing difficulty in maintaining these brake hoses together at least partially due to aging and stretching of the elastomer straps generally used for suspending the glad hand joint from the coupler of the railway vehicle as taught, for example, by the U.S. Pat. No. 4,986,500 to Campbell.

Brake hose supports of a cable type taught by U.S. Pat. No. 5,794,894 to Fremund and U.S. Pat. No. 4,519,564 to Nadherny have not adequately resolved maintenance difficulties.

Should a brake hose become accidentally uncoupled, cut and/or broken for any reason this will result in the brakes being applied to the train. This is obviously an undesirable and, most likely, costly condition, but one which is necessary for the safety of the workers and equipment. The connection between these brake hoses can be broken or the brake hoses themselves may be broken and/or slashed, for example, if they catch on, or are struck by, something sharp that is both tall enough and laying between the rails.

SUMMARY OF THE INVENTION

In a first aspect, the present invention provides an apparatus for lifting a brake hose including a glad hand secured to one end thereof. Such brake hose to be lifted into an elevated position being attached to an end of a railway car. The apparatus further maintains such brake hose in such elevated position during in track service. The apparatus includes a

first member engageable with a predetermined portion of such railway car. A second member is engageable with at least one of such glad hand and such brake hose. There is at least one fluid pressure actuated expansion member disposed between and
5 engageable with such first member and such second member. Further a means is disposed in fluid communication with the at least one fluid pressure actuated expansion member and a source of fluid pressure for expanding such expansion member in a longitudinal direction thereby raising such brake hoses to a
10 predetermined elevated position.

According to an alternative embodiment, the apparatus includes, like the first embodiment, a first member engageable with a predetermined portion of such railway car. A second member, also like the first embodiment, is engageable with one
15 of such glad hand and such brake hose. In this embodiment there is a biasing means caged between at least a portion of such first member and at least a portion of the second member for lifting and maintaining such brake hoses in such elevated position.

20 In yet another alternative embodiment of the invention, the apparatus includes, like the other embodiments, both the first member which is engageable with a predetermined portion of such railway car and the second member which is engageable with one of such glad hand and such brake hose. In this embodiment,

there is an air muscle engaged at a first end thereof to such first member and engaged at a second end thereof to such second member. A fluid communication means is connected for fluid communication between a source of fluid pressure and the air
5 muscle for causing such air muscle to expand and thereby elevate such brake hose to a desired height.

In a further alternative embodiment of the invention, the apparatus includes, like the other embodiments, both the first member which is engageable with a predetermined portion of such
10 railway car and the second member which is engageable with one of such glad hand and such brake hose. In this embodiment, there is an elastic member manufactured from a material having a thermal shape memory, such as nitinol. The elastic member is engaged at a first end thereof to such first member and engaged
15 at a second end thereof to such second member. A preferred shape of such elastic member is round. An electrical communication means is connected for electrical communication between a source of electric energy and the elastic means for causing such elastic means to contract in a longitudinal direction upon
20 supply of the electric energy and thereby elevate such brake hose to a desired height.

In yet further alternative embodiment of the invention, the apparatus includes such first and second members ends formed in

a hook or a loop like manner with either a spring, air muscle or thermal shape memory member integrally disposed therebetween.

OBJECTS OF THE INVENTION

It is, therefore, one of the primary objects of the present
5 invention to provide a brake hose lifting apparatus which will both lift and maintain the brake hose disposed at each end of a railway car up to and at, respectively, a distance at least sufficient to substantially minimize such brake hose coming into contact with some obstruction which will damage and/or break the
10 hose.

Another object of the present invention is to provide a railway vehicle brake hose lifting apparatus which can be both easily and readily retrofitted onto existing brake equipment.

Still another object of the present invention is to provide
15 a railway vehicle brake hose lifting apparatus which is relative inexpensive to produce.

Yet another object of the present invention is to provide a railway vehicle brake hose lifting apparatus which is relatively easy to install.

20 A further object of the present invention is to provide a railway vehicle brake hose lifting apparatus which requires a minimum amount of maintenance.

Yet a further object of the present invention is to provide a railway vehicle brake hose lifting apparatus which will

substantially minimize detrimental brake applications due to broken brake hoses which will allow a loss of air in the brake pipe.

An additional object of the present invention is to provide
5 a railway vehicle brake hose lifting apparatus which will include a manual release which is easy to operate and maintain in order to facilitate a recoupling operation of the brake hoses.

In addition to the several objects and advantages of the
10 present invention which have been described with some degree of specificity above, various other objects and advantages of the invention will become more readily apparent to those persons who are skilled in the railway braking art from the following more detailed description of such railway vehicle brake hose lifting
15 apparatus, particularly, when such description is taken in conjunction with the attached drawing Figures and with the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation schematic illustration of one
20 form of one embodiment of a railway vehicle brake hose lifting apparatus which employs the use of an air bag arrangement;

FIG. 2 is a partial perspective view of the brake hose lifting apparatus of FIG. 1, particularly showing an adjustable support member;

FIG. 3 is a schematic plan view of another embodiment of a railway vehicle brake hose lifting apparatus which utilizes a spring loaded carrier;

FIG. 4 is a schematic side elevation view of the railway vehicle brake hose lifting apparatus utilizing a spring loaded carrier as illustrated in FIG. 3;

FIG. 5 is a perspective view of a presently preferred embodiment of a spring loaded carrier for use in the railway vehicle brake hose lifting apparatus illustrated in FIGS. 3-4;

FIG. 6 is a schematic side elevation view of still another embodiment of a railway vehicle brake hose lifting apparatus which utilizes an air muscle for lifting the brake hoses into position; and

FIG. 7 is a schematic side elevation view of a further embodiment of a railway vehicle brake hose lifting apparatus which utilizes an alloy material having a thermal shape memory for lifting the brake hoses into position.

BRIEF DESCRIPTION OF THE VARIOUS EMBODIMENTS OF THE PRESENT INVENTION

Prior to proceeding to the more detailed description of the present invention, it should be noted that, for the sake of clarity and understanding, identical components which have identical functions have been identified with identical

reference numerals throughout the several views illustrated in the drawing figures.

Reference is now made, more particularly, to FIGS. 1 and 2. Illustrated therein is one form of an apparatus, generally designated 10, for lifting a brake hose 12. Such brake hose 12 includes a glad hand 14 secured to one end thereof. The brake hose 12 to be lifted into an elevated position is attached to an end of a railway car (not shown). The apparatus 10 further maintains such brake hose 12 in such elevated position during in track service.

In this embodiment, the apparatus 10 includes a first, preferably rigid, member 16 engageable at one end, preferably in a pivotal manner, with a predetermined portion of such railway car (not shown) which is preferably a coupler 18. This first member 16 may be in the form of a reverse L shaped member.

There is a second, preferably rigid, member 20 engageable at one end with one of such glad hand 14 and such brake hose 12. This second member 20 may be in the form of an inverted L shaped member.

Also provided is at least one fluid pressure actuated expansion member 22. Such at least one fluid pressure actuated expansion member 22 is disposed between and engageable with such first member 16 and second member 20. Such at least one fluid pressure actuated expansion member 22 may be a well known

pneumatic cylinder (not shown) having a piston rod (not shown) connected to the second member 20, at least one air bladder or at least one inflatable air cell. Preferably, such at least one fluid pressure actuated expansion member 22 is at least one air
5 bag.

According to this embodiment, there is a means, generally designated 30, in fluid communication with such at least one fluid pressure actuated expansion member 22 and a source of fluid pressure for upwardly expanding the expansion member 22 in
10 a longitudinal direction thereby moving the second member 20 and raising such brake hoses 12 to a predetermined elevated position. The source of fluid pressure may be, for example, the brake hose 12 or some other external source. If the brake hose 12 is used as the source of fluid pressure, the means 30
15 will include a supply line 24 having a choke 26 disposed therein connected between the brake hose 12 and the at least one fluid pressure actuated expansion member 22. Preferably, such choke 26 is manually operable for selectively supplying and discharging such fluid pressure.

20 The apparatus 10 may be further adapted with a means 40 for manually adjusting such predetermined elevated position of the brake hose 12. In such embodiment, the second member 20 may be, for example, comprised of a first and second portions 42 and 44 respectively joined together intermediate the ends of such

second member 20 and including a predetermined plurality of complimentary apertures 46 disposed at a predetermined distance within each first and second portions 42 and 44 respectively with at least a pair of such complimentary apertures 46 aligned
5 to accept a fastening means (not shown), as best shown in FIG. 2, for adjusting a predetermined distance between such ends of the second member 20.

It will be appreciated that pivotal engagement of the apparatus 10 with the coupler 18 provides for flexibility of the
10 brake hose 12 and glad hand 14 as the railway car (not shown) negotiates a turn.

Attention is now directed to FIGS. 3-5, wherein there is illustrated another embodiment of an apparatus, generally designated 100, for lifting a brake hose 12 including a glad
15 hand 14 secured to one end thereof.

In this embodiment, such apparatus 100 includes a first member, generally designated 110, engageable at a first end thereof with a predetermined portion of such railway car (not shown). Such first member 110 includes a hook or a loop like
20 member 112 for pivotal engagement at a first end thereof with such predetermined portion of such railway car (not shown) which is preferably the coupler 18. Such hook or loop like member 112 will be particularly advantageous for connection to a well known

eyelet lug (not shown) of the glad hand 14 or an eyelet lug (not shown) of the coupler 18.

A second member, generally designated 120, is engageable at a first end thereof with a portion of such first member 110
5 disposed intermediate each end of such first member 110. The second end of such second member 120 is engageable with one of such glad hand 14 and such brake hose 12.

A biasing means, generally designated 130, is engageable with and, preferably caged between, at least a portion of such
10 first member 110 and at least a portion of the second member 120 for lifting and maintaining such brake hoses 12 in such elevated position. Preferably, such biasing means is a compression spring 114 having a predetermined spring rate. Advantageously, the brake hose 12 is also caged within the second member 120.

15 It will be appreciated that an extension spring 114 may be utilized in place of the fluid pressure actuated expansion member 22 in FIG. 1.

Alternatively, a compression spring 114 having a predetermined spring rate and further having the hook or the
20 loop like portion 112 at each end thereof may be utilized for directly engaging the coupler 18 at one end and one of such glad hand 14 and such brake hose 12 at the other end for lifting and maintaining such brake hoses 12 in such elevated position.

It will be understood that such spring 114 may be manually stretched to engage one of such glad hand 14 and such brake hose 12 and then released to elevate such brake hose 12 to a predetermined position. Thus, a person manually stretching such
5 spring 114 will be the source of energy causing such spring 114 to contract.

Refer now to FIG. 6. Shown therein is still yet another embodiment of an apparatus, generally designated 200, for lifting a brake hose 12 having a glad hand 14 secured to one
10 end thereof into an elevated position. Such brake hose being attached to an end of a railway car (not shown). Such apparatus 200 further maintaining such brake hose 12 in such elevated position during in track service.

The apparatus in this embodiment includes a first member,
15 preferably a bracket 210, which is engageable with a predetermined portion of such railway car (not shown) which is preferably the coupler 18.

A second member 220 is engageable with one of such glad hand 14 and such brake hose 16.

20 There is an air muscle 230 engaged at a first end thereof to such first member 210 and engaged at a second end thereof to said second member 220.

A fluid communication means, generally designated 240, is connected for fluid communication between a source of fluid

pressure and such air muscle 230 for causing the air muscle 230 to contract in a longitudinal direction with application of such fluid pressure and thereby elevate such brake hose 12 to a desired height. If the brake hose 12 is used as the source of
5 fluid pressure, the means 240 will include a supply line 242 having a choke 244 disposed therein connected between the brake hose 12 and the air muscle 230.

Advantageously, such air muscle 230 is self-dampening during contraction and its flexible material construction
10 cushions downward movement of the brake hose 12 during extension in such longitudinal direction.

It will be understood that the hook like portion 112 may be integrally connected to each end of the air muscle 230 for engaging the coupler 18 at one end and one of such glad hand 14
15 and such brake hose 12 at the other end.

A further embodiment of an apparatus, generally designated 300, for lifting a brake hose 12 having a glad hand 14 secured to one end thereof into an elevated position is shown in FIG. 7. Such brake hose 12 being attached to an end of
20 a railway car (not shown). Such apparatus 300 further maintains such brake hose 12 in such elevated position during in track service.

The apparatus in this embodiment includes a first member 310 which is engageable with a predetermined portion of such railway car (not shown) which is preferably the coupler 18.

A second member 320 is engageable with one of such glad
5 hand 14 and such brake hose 16.

A member 330 manufactured from an elastic alloy material having a thermal shape memory, such as nitinol, is engaged at a first end thereof to such first member 310 and engaged at a second end thereof to said second member 320. Such member 330
10 has an electrical connection 340 with an energy source (not shown), which is either a DC or AC electrical energy source. Such member 330 has a predetermined shape and a predetermined size. The preferred predetermined shape of such member 330 is round. A preferred shape of first and second members 310 and 320
15 respectively is a hook or a loop. It is further preferred that such first and second members 310 and 320 respectively are formed integral to the thermal shape memory member 330.

As it well known, such nitinol material will shorten in length when electrically powered and thereby lift such brake
20 hose 12 to a predetermined elevated position.

It will be appreciated that embodiments of FIGS. 1-7 and, particularly the air muscle of FIG. 6, provide an inexpensive and relatively easy to install apparatus for lifting the brake hose 12 to such desired height and maintaining such brake

hose 12 in such elevated position during in track service. Furthermore, such apparatus requires minimal amount of maintenance.

Thus, the present invention has been described in such
5 full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains to make and use the same. It will be understood that variations, modifications, equivalents and substitutions for components of the specifically described embodiments of the invention may be made by those
10 skilled in the art without departing from the spirit and scope of the invention as set forth in the appended claims.

We Claim:

1. An apparatus for lifting a brake hose including a glad
hand secured to one end thereof, such brake hose to be lifted
into a predetermined elevated position being attached to an end
5 of a railway car, said apparatus further maintaining such brake
hose in such predetermined elevated position during in track
service, said apparatus comprising:

(a) a first member engageable with a predetermined portion
of such railway car;

10 (b) a second member engageable with one of such glad hand
and such brake hose;

(c) at least one fluid pressure actuated expansion member
disposed between and engageable with said first member and said
second member; and

15 (d) a means in fluid communication with said at least one
fluid pressure actuated expansion member and a source of a fluid
pressure for expanding said expansion member in a longitudinal
direction upon supply of said fluid pressure thereby raising
such brake hoses to such predetermined elevated position.

20

2. The apparatus according to claim 1, wherein said at
least one fluid pressure actuated expansion member is at least
one of a cylinder, bellow, bladder, air cell and air bag.

3. The apparatus according to claim 1, wherein said source of fluid pressure is such brake hose.

4. The apparatus according to claim 3, wherein said
5 apparatus includes a supply line connected between such brake hose and said at least one fluid pressure actuated expansion member, said supply line having a choke disposed therein for selectively supplying and discharging said fluid pressure.

10 5. The apparatus according to claim 1, wherein said apparatus includes a means for manually adjusting said predetermined elevated position of such brake hose.

6. The apparatus according to claim 1, wherein said first
15 member is pivotally connected to a coupler of such railway car and said second member is pivotally connected to one of such glad hand and such brake hose.

20 7. An apparatus for lifting a brake hose including a glad hand secured to one end thereof, such brake hose to be lifted into a predetermined position being attached to an end of a railway car, said apparatus further maintaining such brake hose

in such predetermined elevated position during in track service,
said apparatus comprising:

(a) a first member engageable with a predetermined portion
of such railway car;

5 (b) a second member engageable with one of such glad hand
and such brake hose; and

(c) a biasing means disposed intermediate at least a
portion of said first member and at least a portion of said
second member for lifting and maintaining such brake hoses in
10 such predetermined elevated position.

8. The apparatus according to claim 7, wherein said biasing
means is caged between said at least portion of said first
member and said at least portion of said second member.
15

9. The apparatus according to claim 7, wherein said biasing
means is a spring having a predetermined spring rate.

10. The apparatus according to claim 9, wherein said spring
20 is one of a compression and a tension spring.

11. The apparatus according to claim 7, wherein said first
and said second member include means for pivotal attachment to

at least one of said predetermined portion of such railway car,
such brake hose and such glad hand.

12. The apparatus according to claim 11, wherein said means
5 is one of a hook and a loop.

13. An apparatus for lifting a brake hose including a
glad hand secured to one end thereof, such brake hose to be
lifted into a predetermined elevated position being attached to
10 an end of a railway car, said apparatus further maintaining such
brake hose in such predetermined elevated position during in
track service, said apparatus comprising:

(a) a first member engageable with a predetermined portion
of such railway car;

15 (b) a second member engageable with one of such glad hand
and such brake hose;

(c) an air muscle engaged at a first end thereof to said
first member and engaged at a second end thereof to said second
member; and

20 (d) a fluid communication means connected for fluid
communication between a source of a fluid pressure and said air
muscle for causing said air muscle to contract in a longitudinal
direction upon supply of said fluid pressure and thereby elevate
such brake hose to such predetermined elevated position.

14. An apparatus for lifting a brake hose including a glad hand secured to one end thereof, such brake hose to be lifted into a predetermined elevated position being attached to an end of a railway car, said apparatus further maintaining such brake
5 hose in such predetermined elevated position during in track service, said apparatus comprising:

(a) a first member engageable with a predetermined portion of such railway car;

(b) a second member engageable with one of such glad hand
10 and such brake hose;

(c) an elastic means with a thermal shape memory engaged at a first end thereof to said first member and engaged at a second end thereof to said second member, said elastic means having a predetermined shape and a predetermined size; and

15 (d) an electrical communication means connected for electrical communication between a source of electric energy and said elastic means for causing said elastic means to contract in a longitudinal direction upon supply of said electric energy and thereby elevate such brake hose to such predetermined elevated
20 position.

15. The apparatus according to claim 14, wherein said predetermined shape of said elastic means is round.

16. The apparatus according to claim 14, wherein said source of electric energy is one of DC and AC.

17. An apparatus for lifting a brake hose including a glad
5 hand secured to one end thereof, such brake hose to be lifted into a predetermined elevated position being attached to an end of a railway car, said apparatus further maintaining such brake hose in such predetermined elevated position during in track service, said apparatus comprising:

10 (a) a first end engageable with a predetermined portion of such railway car;

(b) a second end engageable with one of such glad hand and such brake hose;

(c) means disposed intermediate said first end and said
15 second end and integrally connected thereto, said means connectable to or engageable with an energy source, said means longitudinally contractible in a direction of said first end upon supply of an energy medium from said energy source to lift such brake hose to such predetermined elevated position.

20

18. The apparatus according to claim 17, wherein said means is one of a spring, air muscle and elastic member having a thermal shape memory.

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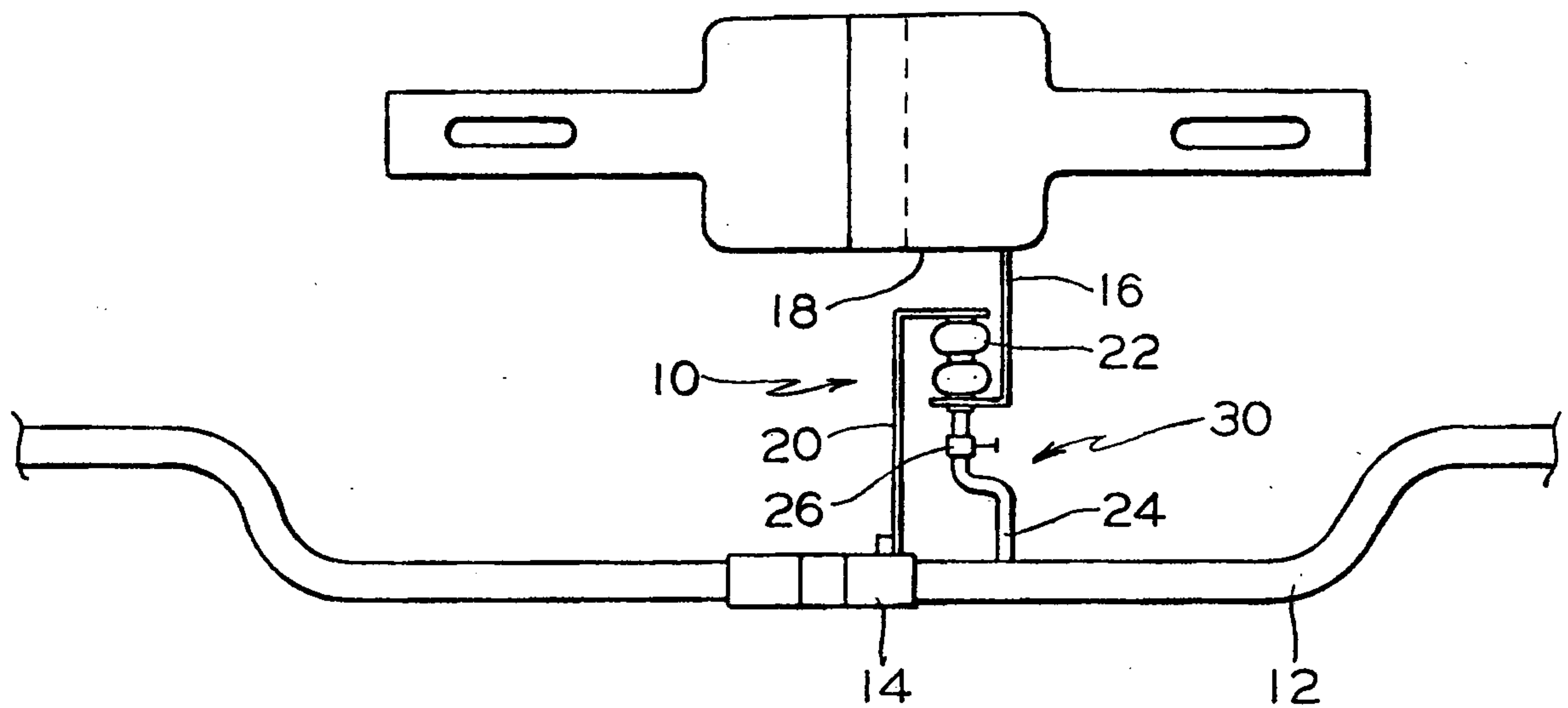


FIG. 1

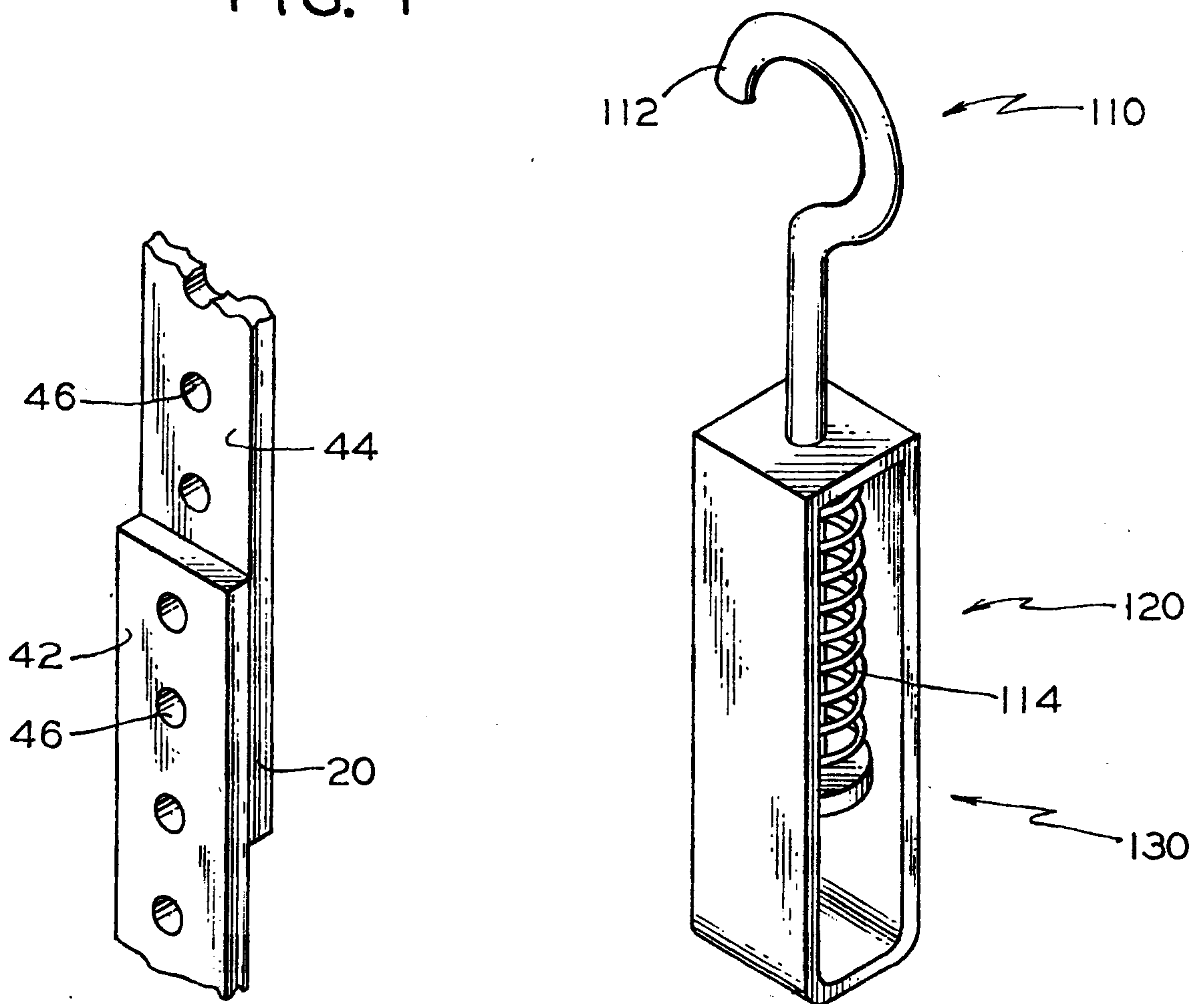


FIG. 2

FIG. 5

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FIG. 3

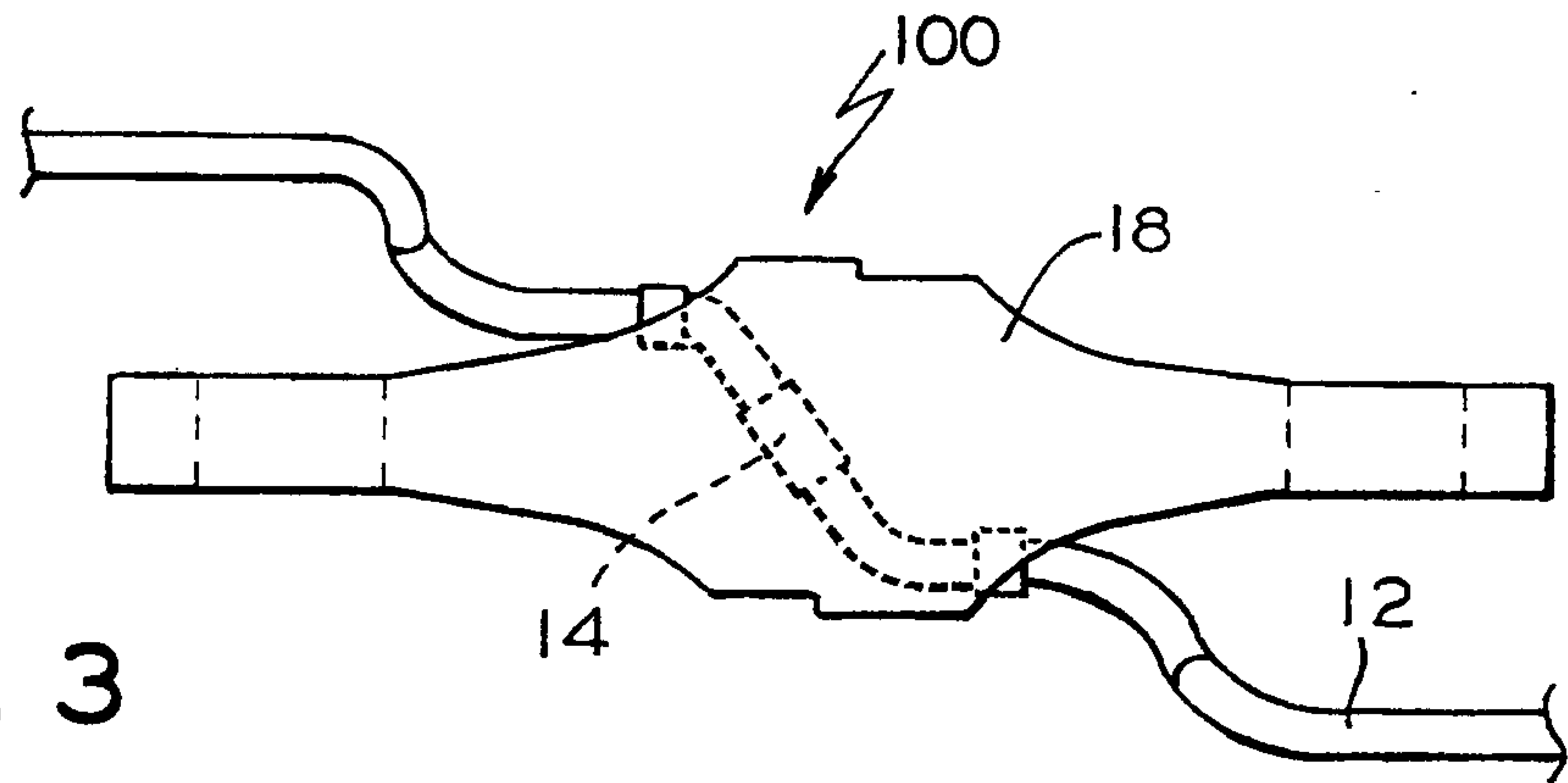


FIG. 4

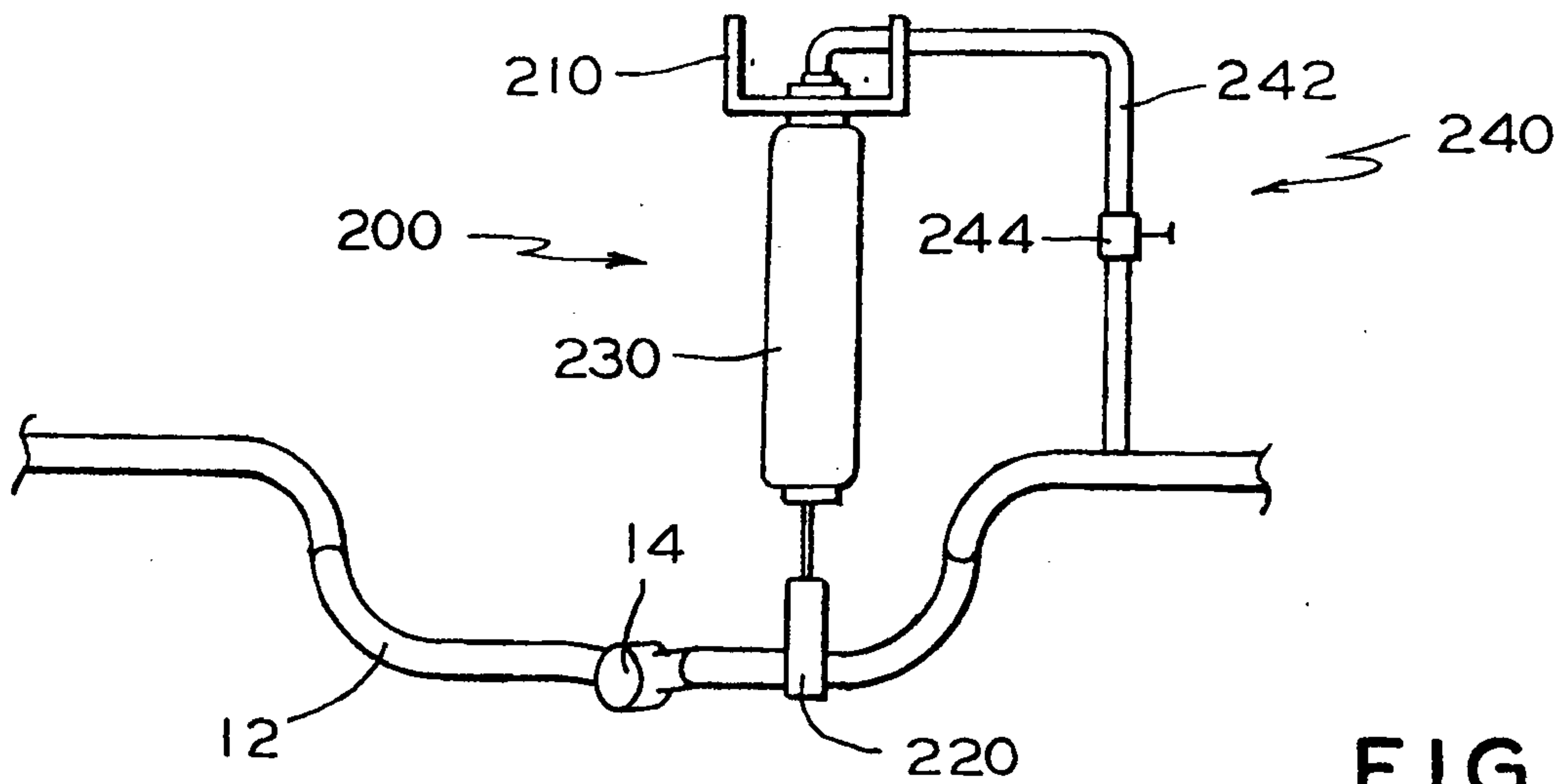
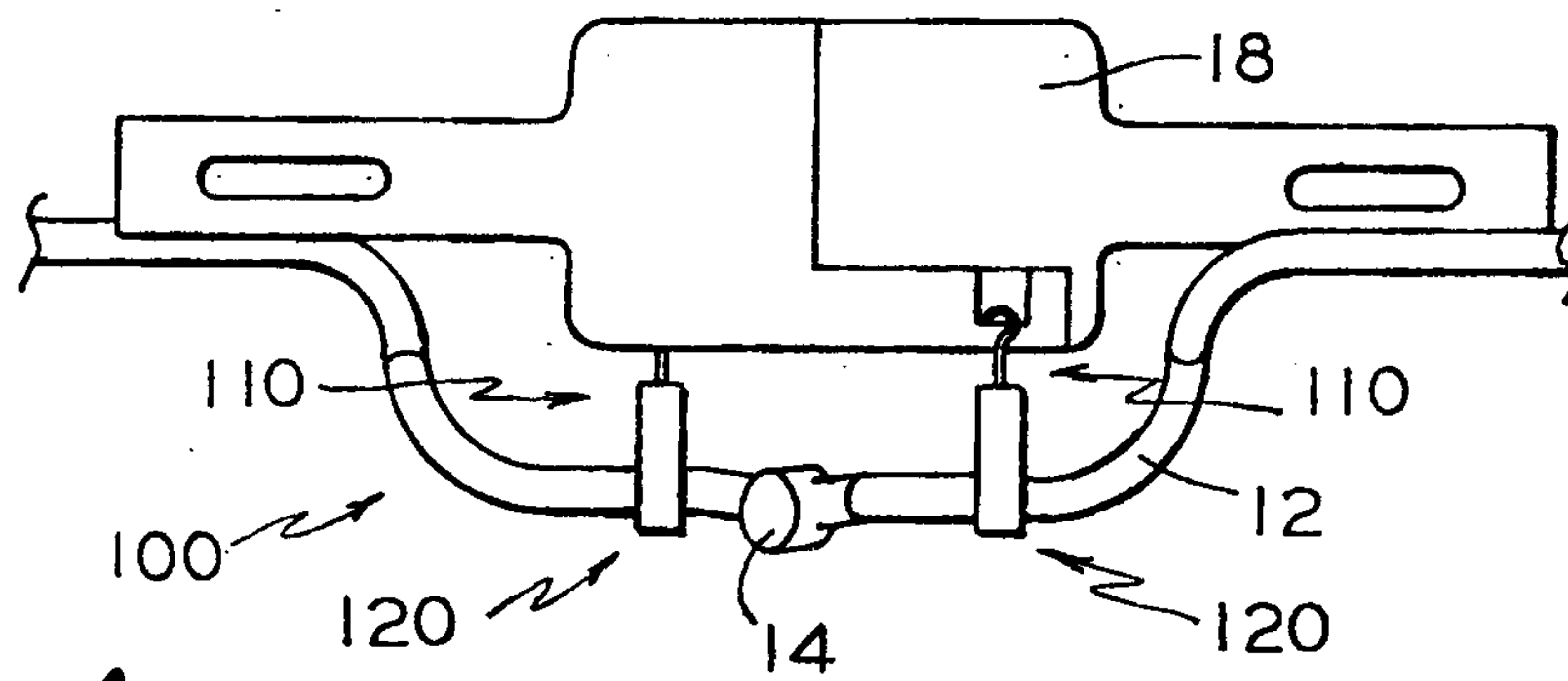


FIG. 6

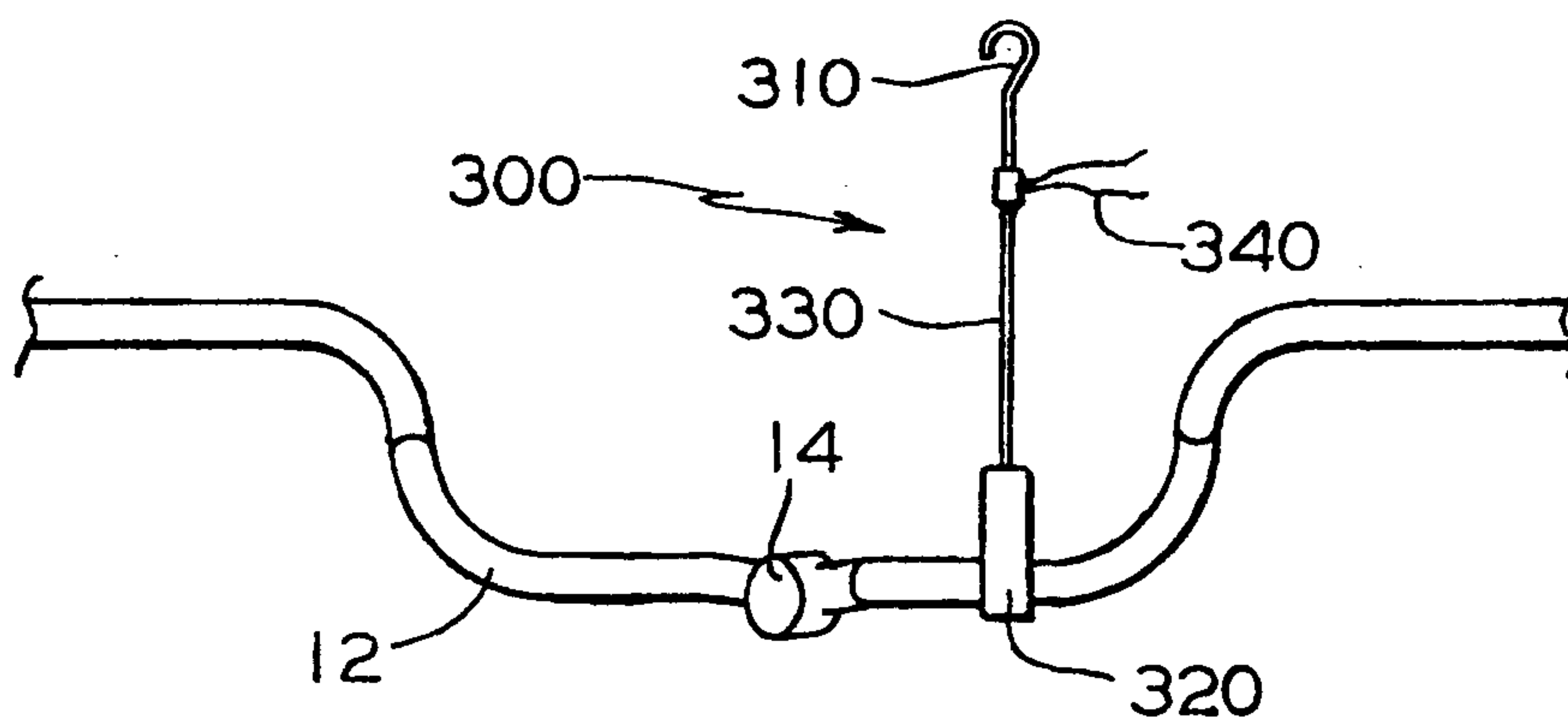


FIG. 7

