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(54) **Lifeboat hoisting and lowering apparatus provided with a fall preventing device**

Rettungsboot Hub- und Senkvorrichtung mit einer Fallschutzvorrichtung

Appareil pour lever et baisser un bateau de secours doté d'un dispositif de prévention de chute

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Description

[0001] The present invention relates to an apparatus for hoisting and lowering a lifeboat, wherein the hoisting/lowering apparatus comprises a pair of on-load anchoring devices intended to be fastened to the bow and to stem of the lifeboat, respectively, and wherein a fall preventing device is associated to each anchoring device and is arranged to prevent the lifeboat from falling in case of accidental release of the hook of the anchoring device.

[0002] Hoisting/lowering apparatuses comprising capstans, cranes and cables are conventionally used for the hoisting and lowering of lifeboats. Two hoisting/lowering cables are required for each lifeboat and are each connected at its bottom end by means of a block to a respective hoisting/lowering chain comprising a hoisting/lowering link. The hoisting/lowering link of one of the two hoisting/lowering cables is coupled to a first anchoring device fastened to the bow of the lifeboat, while the hoisting/lowering link of the other hoisting/lowering cable is coupled to a second anchoring device fastened to the stem of the lifeboat. Therefore, in order to allow the lifeboat to leave its normal place in case of a drill or in case of a real emergency, it must be disconnected from the support structure consisting of the two hoisting/lowering chains by release of the anchoring devices installed in the bow and in the stem of the lifeboat.

[0003] There are two main kinds of anchoring devices for lifeboats:

- the so-called off-load anchoring devices, which can be opened (released) only when they are not subject to any load; and
- the so-called on-load anchoring devices, which can be opened (released) even when they are subject to a load.

[0004] An off-load anchoring device requires that the lifeboat be completely in its floating operative state in order for a crew member be able to release by hand the hoisting/lowering link connected to the hoisting/lowering cable from the hook of the anchoring device fastened to the lifeboat.

[0005] An on-load anchoring device, which has become mandatory on the lifeboats of the new vessels since 1986, works mainly as an off-load device, in that when the lifeboat is in floating conditions the hoisting/lowering link connected to the hoisting/lowering cable can always be released by hand from the respective anchoring device fastened to the lifeboat. Therefore, also with this kind of anchoring device the standard procedure requires that release takes place when the lifeboat is completely in its floating operative state. The peculiarity of the on-load anchoring devices is however that they allow to release the lifeboat even when this latter is not immersed in the water, i.e. even when the anchoring devices of the lifeboat are subject to a load (the load being the sum of the lifeboat's own weight and of the total weight of the persons accommodated inside the lifeboat). In this case, a remote control device operable by the operator from the inside of the lifeboat (for instance by means of a control cable connected to a control lever or handle, or even by means of a hydraulic control apparatus) is provided for release of the lifeboat and is arranged to bring about simultaneously the opening of both the anchoring devices of the lifeboat. This kind of anchoring device is advantageous especially in rough sea conditions, where it would be very difficult, as well as dangerous, for the operator to try to release by hand the hoisting/lowering links from the hooks of the anchoring devices in the bow and in the stem of the lifeboat while this latter is being shaken by the waves.

[0006] The on-load anchoring devices typically comprise a support body or housing, consisting of a pair of parallel plates firmly secured to the lifeboat, and a hook rotatably supported by the support body or housing to rotate between a closed position, in which the hook is coupled to the respective hoisting/lowering link, and an open position, in which the hook is released from the respective hoisting/lowering link. The hook is normally kept in the aforesaid closed position by means of a suitable locking mechanism, in order to prevent the anchoring device from opening automatically under load. In order to release the lifeboat it is therefore necessary first to deactivate the locking mechanisms associated to the two anchoring devices in the bow and in the stem, and this is done simultaneously for the two locking mechanisms by means of the aforesaid remote control device. Once the hooks of the two anchoring devices are no more locked by the respective locking mechanisms, they are free to rotate from the closed position to the open position as a result of the loads acting on them.

[0007] The on-load anchoring devices suffer however from the drawback that a possible fault or failure of the locking mechanism and/or of the associated remote control device, a possible mistake by the crew or a possible incorrect reset of the locking mechanism after a previous operation may cause early release of the anchoring device, resulting in the fall of the lifeboat. Even though a great part of the on-load anchoring devices which are currently on the market and are installed on the lifeboats have a design which is regarded as being instable, and hence not free from risks of early release, the on-load anchoring devices cover the vast majority of the lifeboats currently used in the field of shipping.

[0008] In order to make the on-load anchoring devices safer, fall preventing devices have thus been conceived which are associated each to a respective on-load anchoring device and prevent a possible accidental release of the hook from resulting in the disconnection of the anchoring device from the hoisting/lowering link of the respective hoisting/lowering cable and hence in the fall of the lifeboat.

[0009] A first type of fall preventing devices, which is disclosed for instance in GB2390638 and in US6920839, substantially provides for the use of a safety pin which is

inserted into a pair of through holes made in the two parallel plates of the support body of the on-load anchoring device and locks the hook in the closed position, thereby preventing it from accidentally opening. The safety pin must therefore be properly removed by a crew member to allow the anchoring device to be opened and hence the lifeboat to be released. However, this first type of fall preventing devices has the drawback that it requires to make holes in the support body of the anchoring device for insertion of the safety pin and that it cannot therefore be applied to anchoring devices already on the market, since these latter have been designed and approved without safety pins. The use of this first type of fall preventing devices requires therefore that the anchoring device provided with fall preventing device obtains the necessary approval from the authorized control boards, just as it was a new anchoring device, or alternatively that the anchoring device manufacturers authorize the users to modify the anchoring devices already present on the market and take on the responsibility for any damages resulting from these modifications.

[0010] A second type of fall preventing devices is disclosed for instance in US5078073 and provides for the use of a safety cable connected at its top end to the hoisting/lowering cable and at its bottom end to the support body of the anchoring device so as to provide an auxiliary connection line between the hoisting/lowering cable and the support body of the anchoring device which is separate from the main connection line which connects the hoisting/lowering cable to the hook of the anchoring device and acts in parallel to the main one. In normal operating conditions, the safety cable is not pulled and the load due to the lifeboat's own weight is transmitted to the hoisting/lowering cable via the main connection line. In case of accidental opening of the anchoring device, and hence of interruption of the connection of the anchoring device with the hoisting/lowering cable via the main connection line, the anchoring device, along with the lifeboat, remains connected to the hoisting/lowering cable by virtue of the safety cable of the auxiliary connection line, thereby preventing the lifeboat from falling. In order to release the lifeboat, the operator must previously disconnect the safety cable from the anchoring device, and to this end the bottom end of the safety cable is connected to the support body of the anchoring device by means of a shackle provided with a quick-release pin inserted into a through hole of an auxiliary hanging plate normally provided for in the on-load anchoring devices, the auxiliary hanging plate being fastened to the support body of the anchoring device. In order to disconnect the safety cable from the anchoring device, the pin must be removed from the respective hole in the auxiliary hanging plate, and this requires that the operator completely leaves the lifeboat, or at least leans out of the lifeboat through one of the hatches provided therein. The removal of the pin is not therefore a simple and safe operation, particularly in rough sea conditions or in unfavourable weather conditions.

[0011] The present invention aims therefore at providing a lifeboat hoisting/lowering apparatus comprising a pair of on-load anchoring devices fastened to the bow and to the stem of the lifeboat, respectively, and a pair of fall preventing devices associated each to a respective anchoring device, which has a reliable operation, which does not require modifications to the structure of the anchoring devices and which allows to the crew on board of the lifeboat to release the lifeboat in absolutely safe conditions.

[0012] This and other objects are fully achieved according to the present invention by virtue of a lifeboat hoisting/lowering apparatus having the features set forth in the characterizing part of the attached independent claim 1.

[0013] Further advantageous features of the present invention are set forth in the dependent claims, the subject-matter of which is to be intended as integral and integrating part of the following description.

[0014] In short, the invention is based on the idea of providing a lifeboat hoisting/lowering apparatus, wherein a fall preventing device is associated to each anchoring device and is of the type comprising an auxiliary connection line between the hoisting/lowering cable and the support body of the anchoring device separate from the main connection line which connects the hoisting/lowering cable to the hook of the anchoring device, wherein the auxiliary connection line is arranged to act in parallel to the main one, wherein the auxiliary connection line is configured in such a manner that it does not transmit loads, in normal operating conditions, from the lifeboat to the hoisting/lowering cable, and wherein the auxiliary connection line comprises an elongated flexible transmission member connected at its bottom end to the support body of the anchoring device and at its top end to the hoisting/lowering link, a quick-release safety pin normally interposed between the elongated flexible transmission member and the support body of the anchoring device so as to ensure the connection between the elongated flexible transmission member and the support body of the anchoring device, and remote control means operatively associated to the safety pin to remove the safety pin and thus disconnect the elongated flexible transmission member, and hence the hoisting/lowering link, from the support body of the anchoring device.

[0015] According to the present invention, the expression "elongated flexible transmission member" is to be intended as referring to any non-rigid elongated connection member, such as for instance a cable, a strap or a chain, which is able to transmit tension stresses and hence to ensure the connection of the lifeboat to the hoisting/lowering cable in case of accidental opening of the anchoring device.

[0016] By virtue of the use of the aforesaid remote control means, the operator can remove the safety pin while remaining inside the lifeboat, and hence without having to leave it completely or having to lean out of one of the hatches thereof to act by hand directly on the safety pin.

[0017] Preferably, said remote control means comprise a cable connected at the one end to the safety pin and at the opposite end to a handle or other control member operable by hand, the cable passing through an already existing hatch of the lifeboat or through a hole specifically made in a wall of the lifeboat in such a manner that the handle is located inside the lifeboat and is therefore easily operable by the operator.

[0018] According to a further advantageous aspect of the present invention, flexible stop means are provided at the end of the safety pin opposite to the one from which the control cable extends and are configured to offer a low resistance to the removal of the safety pin when this latter is pulled by the operator by means of the control cable.

[0019] The present invention also relates to a fall preventing device for a lifeboat hoisting/lowering apparatus as set forth in independent claim 1 and in the claims depending thereon.

[0020] Further features and advantages of the present invention will appear from the following detailed description, given purely by way of non-limiting example with reference to the appended drawings, in which:

Figure 1 is a side elevation view showing a lifeboat with an associated hoisting/lowering apparatus according to a preferred embodiment of the present invention;

Figures 2 and 3 are side elevation views showing on an enlarged scale an anchoring device of the lifeboat of Figure 1 along with the associated fall preventing device, in the normal operating condition (i.e. with the hook in the closed position) and in the condition of accidental opening of the hook, respectively;

Figures 4 to 6 are an axial section view, a side elevation view and a front elevation view, respectively, of the fall preventing device of Figures 2 and 3; and

Figure 7 is an axial section view showing on an enlarged scale a safety pin of the fall preventing device of Figures 2 and 3.

[0021] With reference first to Figure 1, a lifeboat is generally indicated 10 and comprises in per-se-known manner a hull 12, having a bow 14 and a stem 16, and a driving cab 18. A hoisting/lowering apparatus is provided for hoisting and lowering the lifeboat 10 and comprises a pair of hoisting/lowering cables 20 releasably connected to a pair of on-load anchoring devices 22 firmly secured to the bow 14 and to the stem 16 of the lifeboat 10, respectively. As can be better seen in Figure 2, each hoisting/lowering cable 20 is connected at its bottom end through a block 24 to a respective hoisting/lowering chain 26 comprising a plurality of links, of which a bottom end link 28 (hereinafter referred to as suspension link) is coupled to a hook 30 of the respective anchoring device 22.

[0022] Each anchoring device 22 comprises, in per-se-known manner, a support body 32, which consists for instance of a pair of parallel plates and is firmly anchored to the lifeboat 10, and the aforesaid hook 30, which is rotatably supported by the support body 32 to rotate between a closed position (Figure 2), in which the hook 30 is coupled to the suspension link 28 of the respective hoisting/lowering chain 26, and an open position (Figures 3), in which the hook 30 is released from the suspension link 28 of the respective hoisting/lowering chain 26. The hook 30 is normally kept in the aforesaid closed position by means of a special locking mechanism, which is of per-se-known type and is not shown, in order to prevent the anchoring device 22 from automatically opening under load. In order to allow the operator to deactivate the locking mechanism of each anchoring device 22, and thus allow the release from the respective hoisting/lowering chain 26, a main remote control device comprising for instance a control cable 34 (or, alternatively, a hydraulic control mechanism) is associated in per-se-known manner to each anchoring device 22. Moreover, an auxiliary hanging plate 36 having a through hole 38 (which can be seen only in Figure 4) is fastened in per-se-known manner to the support body 32 of each anchoring device 22.

[0023] A fall preventing device, which is generally indicated 40 and is arranged to prevent the lifeboat 10 from falling in case of accidental opening of the hook 30 of the anchoring device 22, is associated to each anchoring device 22. Each fall preventing device 40 comprises a hoisting/lowering strap 40 (or other elongated flexible connection member, such as for instance a cable or a chain) interposed between the respective hoisting/lowering cable 20 and the support body 32 of the respective anchoring device 22. The hoisting/lowering strap 42 is connected at its top end to a shackle 44 which connects the hoisting/lowering chain 26 to the block 24 (and which is therefore placed upstream of the suspension link 28) and at its bottom end to the support body 32 of the anchoring device 22 (more specifically, to the auxiliary hanging plate 36 secured to the support body 32), so as to provide an auxiliary connection line between the hoisting/lowering cable 20 and the support body 32 separate from the main connection line which connects the hoisting/lowering cable 20 to the hook 30 of the anchoring device 22 via the suspension link 28. The auxiliary connection line comprising the hoisting/lowering strap 42 is configured to act in parallel to the main connection line comprising the suspension link 28, whereby in case of disconnection between the hoisting/lowering cable and the support body as a result of an accidental opening of the hook of the anchoring device, the support body of the anchoring device, and hence the lifeboat firmly secured thereto, remains connected to the hoisting/lowering cable via the auxiliary connection line. In this way, even in case of accidental opening of the hook 30, the support body 32, and hence the lifeboat 10, remains connected to the hoisting/lowering cable 20 via the hoisting/lowering strap 42 of the fall preventing device 40.

[0024] More precisely, as better illustrated in Figures 4 to 6, the hoisting/lowering strap 42 is connected to the

shackle 44 by means of a further shackle 46 of per-se-known type, which is provided with a locking bolt 48, a nut 50 and a peg 52, whereby the ring-like portion of the shackle 46 is coupled to the shackle 44, whereas a loop-shaped top end portion of the hoisting/lowering strap 42 is wound on the shank of the locking bolt 48. At its bottom end, the hoisting/lowering strap 42 is connected to the auxiliary hanging plate 36 of the support body 32 by means of a shackle 54 ofper-se-known type, provided with a locking bolt 56, a nut 58 and a peg 60, and a connection body 62. The shackle 54 is arranged in such a manner that a loop-shaped bottom end portion of the hoisting/lowering strap 42 is wound on the shank of its locking bolt 56, whereas its ring-like portion is coupled to the connection body 62 by means of a safety pin 64. The connection body 62 is a metal body of substantially cylindrical shape having a first diametral groove 66 which opens towards the upper face of the connection body 62 and receives the ring-like portion of the shackle 54, a first through hole 68 which extends along a diametral direction perpendicular to the first groove 66 and receives the safety pin 64, a second diametral groove 70, which opens towards the bottom face of the connection body 62, extending for instance parallel to the first groove 66, and receives the auxiliary hanging plate 36 of the support body 32, and a second through hole 72, which extends along a diametral direction perpendicular to the second groove 70 and receives a pin 74 which, passing through the through hole 38 of the auxiliary hanging plate 36 as well, connects this latter to the connection body 62 and then, via the shackle 54, to the hoisting/lowering strap 42.

[0025] The shackles 44, 46 and 54 are made in the illustrated example as Ω-shaped shackles, but it is clear that shackles of different type, for instance U-shaped shackles, may be used either.

[0026] The length of the auxiliary connection line, which comprises in order from the top to the bottom the shackle 46, the hoisting/lowering strap 42, the shackle 54 and the connection body 62, is chosen in such a manner that it does not transmit loads, in normal operating conditions, from the lifeboat 10 to the hoisting/lowering cable 20. Just in case of accidental opening of the hook 30 of the anchoring device 22, the lifeboat 10 remains connected to the hoisting/lowering cable 20 only via the auxiliary connection line and therefore this latter is subject to a pulling force.

[0027] The pin 74 which connects the connection body 62 to the auxiliary hanging plate 36 has at the one end thereof (the left-hand end, according to the point of view of the observer of Figure 4) a head 76, whereas at the opposite end (the right-hand end, according to the point of view of the observer of Figure 4) is provided with a peg 78, in such a manner that the head 76 on the one side and the peg 78 on the other prevent the pin 74 from being removed from the respective holes 72 and 38 in either directions, as a result for instance of vibrations. On the other hand, the safety pin 64 is configured in such a manner that the operator inside the lifeboat 10 can easily and quickly remove it from the connection body 62 to interrupt the auxiliary connection line and hence allow the release of the lifeboat. To this end, the safety pin 64 is provided at the one end thereof (the right-hand end, according to the point of view of the observer of Figure 4) with a flexible stop member 80 configured so as to offer a low resistance to the removal of the safety pin when this latter is subject to a pulling force directed towards the opposite end (directed leftwards, according to the point of view of the observer of Figure 4), whereas from the opposite end (the left-hand end, according to the point of view of the observer of Figure 4) of the safety pin 64 an auxiliary control cable 82 extends towards the driving cab 18 of the lifeboat 10, a control handle 84 being attached to the opposite end of the auxiliary control cable and allowing the operator to apply a pulling force onto the safety pin to remove it from the connection body 62 by overcoming the resistance of the flexible stop member 80. The auxiliary control cable 82 may be secured to the end of the safety pin 64 opposite to the one where the flexible stop member 80 is provided. Alternatively, as will be explained in detail further on, the flexible stop member 80 is advantageously used also to restrain the auxiliary control cable 82 to the safety pin 64. The auxiliary control cable 82 is passed through a through hole 86 provided in a wall 88 (non-carrying wall) of the structure of the lifeboat 10 so as to allow the operator to deactivate the fall preventing device 40 while remaining inside the lifeboat.

[0028] In order to ensure that the pulling force applied onto the safety pin 64 is always directed along the axis of the safety pin, and hence does not cause this latter to jam inside the respective through hole 68 of the connection body 62, a guide structure 90 is fixed to the lateral surface of the connection body 62 next to the through hole 68 and has an inner cavity 92 which extends coaxially with the safety pin 64 and has a length and a cross-section such as to accommodate at least partially the safety pin 64 when this latter is removed from the respective through hole 68. At the end facing towards the connection body 62, the guide structure 90 forms a connection bracket 94 adapted to be fixed to the connection body 62 by means of screws 96, whereas at the opposite end the guide structure 90 forms an end wall 98 having a through hole 100 through which the auxiliary control cable 82 passes. Preferably, the guide structure 90 has at least one groove 102 on its lateral surface so as to allow the operator to inspect inside the guide structure and to check whether the safety pin 64 has been removed from the respective through hole 68, and hence whether the fall preventing device 40 has been deactivated.

[0029] According to the embodiment illustrated in Figures 4 to 6, the auxiliary control cable 82 is made as a steel cable and is inserted into a sheath 104 attached at the one end to the end wall 98 of the guide structure 90 and at the opposite end to a special support member 106 inside the driving cab 18 of the lifeboat 10.

[0030] According to an embodiment of the present invention, a handle 108 is attached to the safety pin 64, on

the same side as the auxiliary control cable 82, and is made for instance as a rod-like element extending perpendicularly to the axis of the safety pin 64. The handle 108 has on the one hand the function of preventing the safety pin 64 from being removed from the through hole 68 in the opposite direction to that of the pulling force applied onto the safety pin via the auxiliary control cable 82 and on the other the function of allowing the operator to remove, if required, the safety pin 64, acting on it by means of the handle, in case the auxiliary control cable 82 does not operate properly.

[0031] As already partially explained, with reference in particular to Figure 7, according to an embodiment of the present invention the flexible stop member 80 is restrained to the safety pin 64 by means of a loop 110 formed by the auxiliary control cable 82, the auxiliary control cable 82 being in this case inserted into an axial through hole 112 provided in the safety pin. Independently of the way of fixing to the safety pin 64, the fact that the stop member 80 is made as a flexible member allows the operator to remove easily and quickly the safety pin from the respective through hole 68 or to insert the safety pin into the through hole by simply applying a pulling force or a compression force, respectively, onto the safety pin.

[0032] In the embodiment of Figure 7, in which the auxiliary control cable 82 is inserted into an axial through hole 112 of the safety pin 64, according to a further advantageous aspect of the present invention the handle 108 is attached to the safety pin 64 by screwing into a threaded through hole 114 which extends radially and hence intersects the axial through hole 112, thereby ensuring that the auxiliary control cable 82 is locked in the safety pin 64.

[0033] When the auxiliary connection line is subject to a load, i.e. in case of interruption of the main connection line due to early opening of the hook 30 of the anchoring device 22, the safety pin 64 cannot be removed from the respective through hole 68 because of the high resistance due to the friction between the cylindrical lateral surface of the safety pin 64 on the one hand and the inner surfaces of the through hole 68 and of the ring-like portion of the shackle 54 in contact with the safety pin 64 on the other hand. This helps to avoid accidental deactivation of the fall preventing device just in those cases where only the fall preventing device 40 ensures the connection of the lifeboat 10 to the hoisting/lowering cable 20.

[0034] As stated above, the auxiliary control cables 82 associated to each fall preventing device 40 are attached, at the end thereof opposite to the one attached to the respective safety pin 64, to a control handle 84 or to a similar hand control member. In this way, the operator wishing to release the lifeboat 10 from the hoisting/lowering cables 20 must operate both the control handles 84 in order to remove the safety pins 64 of both the fall preventing devices 40. According to a variant of embodiment, the auxiliary control cables 82 are both connected, at the end thereof opposite to the one attached to the respective safety pin 64, to a single lever or similar hand control member (not shown), whereby the operator is able to operate simultaneously both the control cables 82 with a single command.

[0035] In view of the above description, the advantages offered by the hoisting/lowering apparatus provided with on-load anchoring devices and associated fall preventing devices according to the present invention are evident.

[0036] The use of fall preventing devices configured so as to provide auxiliary connection lines between the hoisting/lowering cables and the lifeboat minimizes the risk of accidents due to early opening of the anchoring devices by means of which the lifeboat is connected to the hoisting/lowering cables.

[0037] The fall preventing devices forming part of the hoisting/lowering apparatus according the present invention are applicable to the hoisting/lowering chains and anchoring devices currently on the market and therefore do not require to replace the ones or the others, with resulting significant savings of money and time.

[0038] In case of need, the operator is able to deactivate the fall preventing devices easily, quickly and above all in absolutely safe conditions while remaining inside the lifeboat, without thereby having to open the hatches of the lifeboat and/or to work outside the same.

[0039] In the variant of embodiment in which the control cables associated to the fall preventing devices are operable by means of a single hand control member, a single operator can completely release the lifeboat.

[0040] The adoption of the guide structure which allows to orient correctly the end portion, on the side of the fall preventing device, of the control cable relative to the associated safety pin, along with the adoption of a flexible stop member attached to the safety pin on the opposite side with respect to the control cable, minimizes the risk that a pulling force on the control cable does not lead to removal of the safety pin from the respective through hole. In any case, the adoption of a handle attached to the safety pin allows to compensate efficiently for the case - which is however very unlikely - that the safety pin is not removed by means of the control cable.

[0041] Naturally, the principle of the invention remaining unchanged, the embodiments and manufacturing details may be widely varied with respect to those described and illustrated purely by way of non-limiting example, without thereby departing from the scope of the invention as defined in the appended claims.

[0042] For instance, the connection bodies of the fall preventing devices may have a shape different from the one described and illustrated in the present application, as they may be for instance made from two or more separate pieces.

[0043] The guide structures may also have a shape different from the one described and illustrated in the present application and be fixed to the lateral surfaces of the respective connection bodies by means of connection means different from the screw-type one previously described.

[0044] Each fall preventing device may be provided

with an automatic or semi-automatic apparatus for causing the safety pin to get back into the respective through hole, said apparatus consisting for instance of one or more springs applying on the safety pin a force tending to urge it towards the inside of the respective through hole.

[0045] The flexible stop members of the safety pins may have a shape different from the one described and illustrated in the present application, even though they have the same function as the members described and illustrated in the present application.

[0046] Instead of the control cables associated each to a respective safety pin, there may be provided other remote control means (not necessarily or not only of mechanical type, but also of hydraulic or electric type) operable by an operator from the driving cab inside the lifeboat to remove the safety pins from the respective through holes and thus cause the deactivation of the fall preventing devices.

[0047] The safety pins may have a shape different from the one described and illustrated in the present application, as they may be for instance made from two or more separate pieces.

[0048] Each control cable may be axially restrained to the respective safety pin not at the end of the safety pin facing towards the opposite side with respect to the control cable, as in the embodiment described and illustrated in the present application, but towards the same side as the control cable.

Claims

1. Apparatus for hoisting/lowering a lifeboat (10), the hoisting/lowering apparatus comprising
   a plurality of on-load anchoring devices (22) each comprising a support body (32) arranged to be firmly secured to the lifeboat (10), and a hook (30) carried by the support body (32) so as to be movable between an open or release position and a closed or coupling position, a corresponding plurality of hoisting/lowering cables (20) each connected to the hook (30) of a respective anchoring device (22) via a respective main connection line (26, 28), and
   a corresponding plurality of fall preventing devices (40) each associated to a respective anchoring device (22),
   wherein each fall preventing device (40) comprises an auxiliary connection line (42, 46, 54, 62) between the respective hoisting/lowering cable (20) and the support body (32) of the respective anchoring device (22) separate from the main connection line (26, 28),
   wherein the auxiliary connection line (42, 46, 54, 62) of each fall preventing device (40) is arranged to act in parallel to the associated main connection line (26, 28),
   wherein the auxiliary connection line (42, 46, 54, 62) of each fall preventing device (40) is configured in such a manner that in normal operating conditions, i.e. when the hook (30) is in the aforesaid closed or coupled position, it does not transmit loads from the lifeboat (10) to the respective hoisting/lowering cable (20), and
   wherein the auxiliary connection line (42, 46, 54, 62) of each fall preventing device (40) comprises an elongated flexible connection member (42) connected at its bottom end to the support body (32) of the respective anchoring device (22) and at its top end to the respective hoisting/lowering cable (20), and a quick-release safety pin (64) interposed between the elongated flexible connection member (42) and the support body (32) of the respective anchoring device (22) so as to ensure that said elongated flexible connection member and said support body are normally connected to each other and to be removable to interrupt the connection between the respective hoisting/lowering cable (20) and the support body (32) of the respective anchoring device (22) via the auxiliary connection line (42, 46, 54, 62),
   characterized in that it comprises, for each fall preventing device (40), remote control means (82, 84) operatively associated to the safety pin (64) of that fall preventing device (40) to remove the safety pin (64) and thus disconnect the elongated flexible connection member (42) of that fall preventing device (40) from the support body (32) of the respective anchoring device (30).

2. Hoisting/lowering apparatus according to claim 1, wherein the remote control means (82, 84) of each fall preventing device (22) comprise a control cable (82) connected at the one end to the safety pin (64) and at the opposite end to a first hand control member (84) operable by hand by the operator on board of the lifeboat (10).

3. Hoisting/lowering apparatus according to claim 2, wherein at the end of each safety pin (64) opposite to the one from which the respective control cable (82) extends, flexible stop means (80) are provided which are configured so as to offer a low resistance to the removal of the safety pin (64) when this latter is pulled by the operator by means of the respective control cable (82).

4. Hoisting/lowering apparatus according to claim 3, wherein the flexible stop means (80) of each safety pin (64) are restrained to the safety pin (64) by means of a loop (110) formed by the respective control cable (82), the control cable (82) being inserted through an axial through hole (112) provided in the safety pin (64).

5. Hoisting/lowering apparatus according to any of the preceding claims, wherein a second hand control member (108) is attached to each safety pin (64) and

is operable by hand by the operator in case of non-operation of the remote control means (82).

6. Hoisting/lowering apparatus according to claims 4 and 5, wherein the second hand control member (108) of each safety pin (64) is a rod member extending perpendicularly to the axis of the safety pin (64) in such a manner as to prevent the safety pin (64) from being removed in the opposite direction to that of the pulling force applied on it through the respective control cable (82).

7. Hoisting/lowering apparatus according to any of the preceding claims, wherein the elongated flexible connection member (42) of each fall preventing device (40) is connected to the support body (32) of the respective anchoring device (22) through a shackle (54) and a connection body (62), the shackle (54) being connected to the connection body (62) by means of the safety pin (64).

8. Hoisting/lowering apparatus according to claim 7, wherein the shackle (54) comprises a ring-like body and a locking bolt (56) and is arranged in such a manner that a loop-like end portion of the elongated flexible connection member (42) is wound about the locking bolt (56), wherein the connection body (62) has a diametral groove (66) opening upwards and accommodating the ring-like body of the shackle (54), and wherein the safety pin (64) is received in a through hole (68) of the connection body (62) extending perpendicularly to the diametral groove (66).

9. Hoisting/lowering apparatus according to claim 2 and according to either claim 7 or claim 8, wherein the safety pin (64) is received in a diametral through hole (68) of the connection body (62) and wherein the fall preventing device (40) further comprises a guide structure (90) which is attached to the connection body (62) next to the diametral through hole (68) and is arranged to guide an end portion of the control cable (82) facing the anchoring device (22) so as to keep that end portion aligned with the respective safety pin (64).

Patentansprüche

1. Vorrichtung zum Anheben/Absenken eines Rettungsboots (10), wobei die Anhebe-/Absenkvorrichtung umfasst:

   eine Mehrzahl von Verankerungsvorrichtungen (22) an der Last, von welchen jede einen Tragekörper (32), welcher zu einem festen Sichern an dem Rettungsboot (10) angeordnet ist, und einen Haken (30) umfasst, welcher derart von dem Tragekörper (32) getragen ist, dass er zwischen einer offenen oder Freigabe-Position und einer geschlossenen oder Kopplungs-Position bewegbar ist,

   eine entsprechende Mehrzahl von Anhebe-/Absenkkabeln (20), welche jeweils mit dem Haken (30) einer entsprechenden Verankerungsvorrichtung (22) über einen entsprechenden Haupt-Verbindungsstrang (26, 28) verbunden sind, und

   eine entsprechende Mehrzahl von Fall-Verhinderungsvorrichtungen (40), welche jeweils einer entsprechenden Verankerungsvorrichtung (22) zugeordnet sind,

   wobei jede Fall-Verhinderungsvorrichtung (40) einen Hilfs-Verbindungsstrang (42, 46, 54, 62) zwischen dem jeweiligen Anhebe-/Absenkkabel (20) und dem Tragekörper (32) der jeweiligen Verankerungsvorrichtung (22) separat von dem Haupt-Verbindungsstrang (26, 28) umfasst,

   wobei der Hilfs-Verbindungsstrang (42, 46, 54, 62) von jeder Fall-Verhinderungsvorrichtung (40) derart angeordnet ist, dass er parallel zu dem zugeordneten Haupt-Verbindungsstrang (26, 28) wirkt,

   wobei der Hilfs-Verbindungsstrang (42, 46, 54, 62) von jeder Fall-Verhinderungsvorrichtung (40) derart eingerichtet ist, dass in normalen Betriebsbedingungen, d.h. wenn der Haken (30) in der zuvor genannten geschlossenen oder gekoppelten Position ist, sie keine Lasten von dem Rettungsboot (10) auf das jeweilige Anhebe-/Absenkkabel (20) überträgt, und

   wobei der Hilfs-Verbindungsstrang (42, 46, 54, 62) von jeder Fall-Verhinderungsvorrichtung (40) ein längliches flexibles Verbindungselement (42), welches an seinem unteren Ende mit dem Tragekörper (32) der jeweiligen Verankerungsvorrichtung (22) und an seinem oberen Ende mit dem jeweiligen Anhebe-/Absenkkabel (20) verbunden ist, und einen schnell öffnenden Sicherheitsstift (64) umfasst, welcher zwischen dem längliche flexible Verbindungselement (42) und dem Tragekörper (32) der jeweiligen Verankerungsvorrichtung (22) derart angeordnet ist, dass sichergestellt ist, dass das längliche flexible Verbindungselement und der Tragekörper normalerweise miteinander verbunden sind, und um lösbar zu sein, um die Verbindung zwischen dem jeweiligen Anhebe-/Absenkkabel (20) und dem Tragekörper (32) der jeweiligen Verankerungsvorrichtung (22) mittels des Hilfs-Verbindungsstrangs (42, 46, 54, 62) zu unterbrechen,

   dadurch gekennzeichnet, dass es für jede der Fall-Verhinderungsvorrichtungen (40) Fernbedienungsmittel (82, 84) umfasst, welche betriebsmäßig dem Sicherheitsstift (64) dieser Fall-Verhinderungsvorrichtung (40) zugeordnet

sind, um den Sicherheitsstift (64) zu entfernen und somit das längliche flexible Verbindungselement (42) dieser Fall-Verhinderungsvorrichtung (40) von dem Tragekörper (32) der jeweiligen Verankerungsvorrichtung (30) zu trennen.

2. Anhebe-/Absenkvorrichtung nach Anspruch 1, wobei die Fernbedienungsmittel (82, 84) von jeder Fall-Verhinderungsvorrichtung (22) ein Steuerkabel (82) umfassen, welches an dem einen Ende mit dem Sicherheitsstift (64) und an dem gegenüberliegenden Ende mit einem ersten Hand-Steuerelement (84) verbunden ist, welches von dem Bediener an Bord des Rettungsboots (10) von Hand bedienbar ist.

3. Anhebe-/Absenkvorrichtung nach Anspruch 2, wobei an dem Ende von jedem Sicherheitsstift (64), welches demjenigen gegenüber liegt, von dem aus sich das jeweilige Steuerkabel (82) erstreckt, flexible Stop-Mittel (80) bereitgestellt sind, welche derart eingerichtet sind, dass sie dem Entfernen des Sicherheitsstifts (64) einen niedrigen Widerstand bieten, wenn letzterer von dem Bediener mittels des jeweiligen Steuerkabels (82) gezogen wird.

4. Anhebe-/Absenkvorrichtung nach Anspruch 3, wobei die flexiblen Stop-Mittel (80) von jedem Sicherheitsstift (64) mittels einer Schleife (110), welche durch das jeweilige Steuerkabel (82) gebildet ist, an dem Sicherheitsstift (64) zurückgehalten werden, wobei das Steuerkabel (82) durch ein axiales Durchgangsloch (112) eingeführt ist, welches in dem Sicherheitsstift (64) bereitgestellt ist.

5. Anhebe-/Absenkvorrichtung nach einem der vorhergehenden Ansprüche, wobei ein zweites Hand-Steuerelement (108) an jedem Sicherheitsstift (64) angebracht ist und von dem Bediener im Fall, dass die Fernbedienungsmittel (82) außer Betrieb sind, von Hand bedienbar ist.

6. Anhebe-/Absenkvorrichtung nach den Ansprüchen 4 und 5, wobei das zweite Hand-Steuerelement (108) von jedem Sicherheitsstift (64) ein Stangenelement ist, welches sich senkrecht zu der Achse des Sicherheitsstifts (64) derart erstreckt, dass verhindert wird, dass der Sicherheitsstift (64) in die Richtung entgegengesetzt zu derjenigen der Zugkraft entfernt wird, welche auf ihn durch das jeweilige Steuerkabel (82) ausgeübt wird.

7. Anhebe-/Absenkvorrichtung nach einem der vorhergehenden Ansprüche, wobei das längliche flexible Verbindungselement (42) von jeder Fall-Verhinderungsvorrichtung (40) mit dem Tragekörper (32) der jeweiligen Verankerungsvorrichtung (22) durch einen Bügel (54) und einen Verbindungskörper (62) verbunden ist, wobei der Bügel (54) mit dem Verbindungskörper (62) mittels des Sicherheitsstifts (64) verbunden ist.

8. Anhebe-/Absenkvorrichtung nach Anspruch 7, wobei der Bügel (54) einen Ring-artigen Körper und einen Verriegelungsbolzen (56) umfasst und derart angeordnet ist, dass ein Schleifen-artiger Endabschnitt des länglichen flexiblen Verbindungselements (42) um den Verriegelungsbolzen (56) gewickelt ist, wobei der Verbindungskörper (62) eine diametrale Nut (66) aufweist, welche sich nach oben öffnet und den Ring-artigen Körper des Bügels (54) aufnimmt, und wobei der Sicherheitsstift (64) in einem Durchgangsloch (68) des Verbindungskörpers (62) aufgenommen ist, welches sich senkrecht zu der diametralen Nut (66) erstreckt.

9. Anhebe-/Absenkvorrichtung nach Anspruch 2 und nach entweder Anspruch 7 oder Anspruch 8, wobei der Sicherheitsstift (64) in einem diametralen Durchgangsloch (68) des Verbindungskörpers (62) aufgenommen ist, und wobei die Fall-Verhinderungsvorrichtung (40) ferner eine Führungsstruktur (90) umfasst, welche an dem Verbindungskörper (62) neben dem diametralen Durchgangsloch (68) angebracht ist und dazu eingerichtet ist, einen Endabschnitt des Steuerkabels (82) zu führen, der in Richtung der Verankerungsvorrichtung (22) weist, so dass dieser Endabschnitt mit dem jeweiligen Sicherheitsstift (64) ausgerichtet gehalten wird.

Revendications

1. Dispositif pour hisser et descendre un canot de sauvetage (10), le dispositif de levage et de descente comprenant :

une pluralité de dispositifs d'ancrage en charge (22) comprenant chacun un corps de support (32) agencé pour être solidement fixé sur le canot de sauvetage (10), et un crochet (30) porté par le corps de support (32) de manière à être mobile entre une position ouverte ou de libération et une position fermée ou d'accouplement, une pluralité correspondante de câbles de levage/descente (20) reliés chacun au crochet (30) d'un dispositif d'ancrage respectif (22) via une ligne de connexion principale respective (26, 28), et une pluralité correspondante de dispositifs de prévention de chute (40) associés chacun à un dispositif d'ancrage respectif (22),
dans lequel chaque dispositif de prévention de chute (40) comprend une ligne de connexion auxiliaire (42, 46, 54, 62) entre le câble de levage/descente respectif (20) et le corps de support (32) du dispositif d'ancrage respectif (22) séparé de la ligne de connexion principale (26, 28),

dans lequel la ligne de connexion auxiliaire (42, 46, 54, 62) de chaque dispositif de prévention de chute (40) est agencée pour agir parallèlement à la ligne de connexion principale associée (26, 28),
dans lequel la ligne de connexion auxiliaire (42, 46, 54, 62) de chaque dispositif de prévention de chute (40) est configurée de telle manière que dans des conditions de fonctionnement normales, c'est-à-dire quand le crochet (30) est dans ladite position fermée ou accouplée, elle ne transmet pas les charges du canot de sauvetage (10) au câble de levage/descente respectif (20), et
dans lequel la ligne de connexion auxiliaire (42, 46, 54, 62) de chaque dispositif de prévention de chute (40) comprend un élément de connexion flexible allongé (42) connecté en son extrémité inférieure au corps de support (32) du dispositif d'ancrage respectif (22) et en son extrémité supérieure au câble de levage/descente respectif (20), et une goupille de sécurité à décrochage rapide (64) intercalée entre l'élément de connexion flexible allongé (42) et le corps de support (32) du dispositif d'ancrage respectif (22) afin d'assurer que ledit élément de connexion flexible allongé et ledit corps de support sont normalement connectés l'un à l'autre et pouvant être enlevée pour interrompre la connexion entre le câble de levage/descente respectif (20) et le corps de support (32) du dispositif d'ancrage respectif (22) par l'intermédiaire de la ligne de connexion auxiliaire (42, 46, 54, 62),
caractérisé en ce qu'il comprend, pour chaque dispositif de prévention de chute (40), un moyen de commande à distance (82, 84) associé fonctionnellement à la goupille de sécurité (64) de ce dispositif de prévention de chute (40) pour retirer la goupille de sécurité (64) et ainsi déconnecter l'élément de connexion flexible allongé (42) de ce dispositif de prévention de chute (40) d'avec le corps de support (32) du dispositif d'ancrage respectif (30).

2. Dispositif de levage et de descente selon la revendication 1, dans lequel le moyen de commande à distance (82, 84) de chaque dispositif de prévention de chute (22) comprend un câble de commande (82) connecté en une extrémité à la goupille de sécurité (64) et à l'autre extrémité à un premier élément de commande à main (84) pouvant être actionné à la main par l'opérateur se trouvant à bord du canot de sauvetage (10).

3. Dispositif de levage et de descente selon la revendication 2, dans lequel à l'extrémité de chaque goupille de sécurité (64) à l'opposé de celle depuis laquelle s'étend le câble de commande respectif (82), un moyen d'arrêt flexible (80) est prévu, qui est configuré pour offrir une faible résistance au retrait de la goupille de sécurité (64) quand l'opérateur tire sur cette dernière au moyen du câble de commande respectif (82).

4. Dispositif de levage et de descente selon la revendication 3, dans lequel le moyen d'arrêt flexible (80) de chaque goupille de sécurité (64) est maintenu sur la goupille de sécurité (64) au moyen d'une boucle (110) formée par le câble de commande respectif (82), le câble de commande (82) étant inséré dans un trou traversant axial (112) pratiqué dans la goupille de sécurité (64).

5. Dispositif de levage et de descente selon l'une quelconque des revendications précédentes, dans lequel un deuxième élément de commande à main (108) est fixé sur chaque goupille de sécurité (64) et peut être actionné à la main par l'opérateur en cas de non fonctionnement du moyen de commande à distance (82).

6. Dispositif de levage et de descente selon les revendications 4 et 5, dans lequel le deuxième élément de commande à main (108) de chaque goupille de sécurité (64) est un élément en forme de tige s'étendant perpendiculairement à l'axe de la goupille de sécurité (64) de manière à empêcher la goupille de sécurité (64) d'être retirée dans la direction opposée à celle de la force de traction appliquée sur elle par l'intermédiaire du câble de commande respectif (82).

7. Dispositif de levage et de descente selon l'une quelconque des revendications précédentes, dans lequel l'élément de connexion flexible allongé (42) de chaque dispositif de prévention de chute (40) est connecté au corps de support (32) du dispositif d'ancrage respectif (22) au moyen d'une manille (54) et d'un corps de connexion (62), la manille (54) étant connectée au corps de connexion (62) au moyen de la goupille de sécurité (64).

8. Dispositif de levage et de descente selon la revendication 7, dans lequel la manille (54) comprend un corps en forme d'anneau et un boulon de blocage (56) et est agencé de telle manière qu'une partie d'extrémité en forme de boucle de l'élément de connexion flexible allongé (42) est enroulée autour du boulon de blocage (56), dans lequel le corps de connexion (62) comporte une rainure diamétrale (66) qui s'ouvre vers le haut et qui reçoit le corps en forme d'anneau de la manille (54), et dans lequel la goupille de sécurité (64) est insérée dans un trou traversant (68) du corps de connexion (62) qui s'étend perpendiculairement à la rainure diamétrale (66).

9. Dispositif de levage et de descente selon la revendication 2 et selon la revendication 7 ou 8, dans lequel la goupille de sécurité (64) est insérée dans un trou traversant diamétral (68) du corps de connexion (62) et dans lequel le dispositif de prévention de chute (40) comprend en outre une structure de guidage (90) qui est fixée au corps de connexion (62) près du trou traversant diamétral (68) et qui est agencée pour guider une partie d'extrémité du câble de commande (82) située en face du dispositif d'ancrage (22) afin de maintenir cette partie d'extrémité alignée avec la goupille de sécurité respective (64).

FIG 1

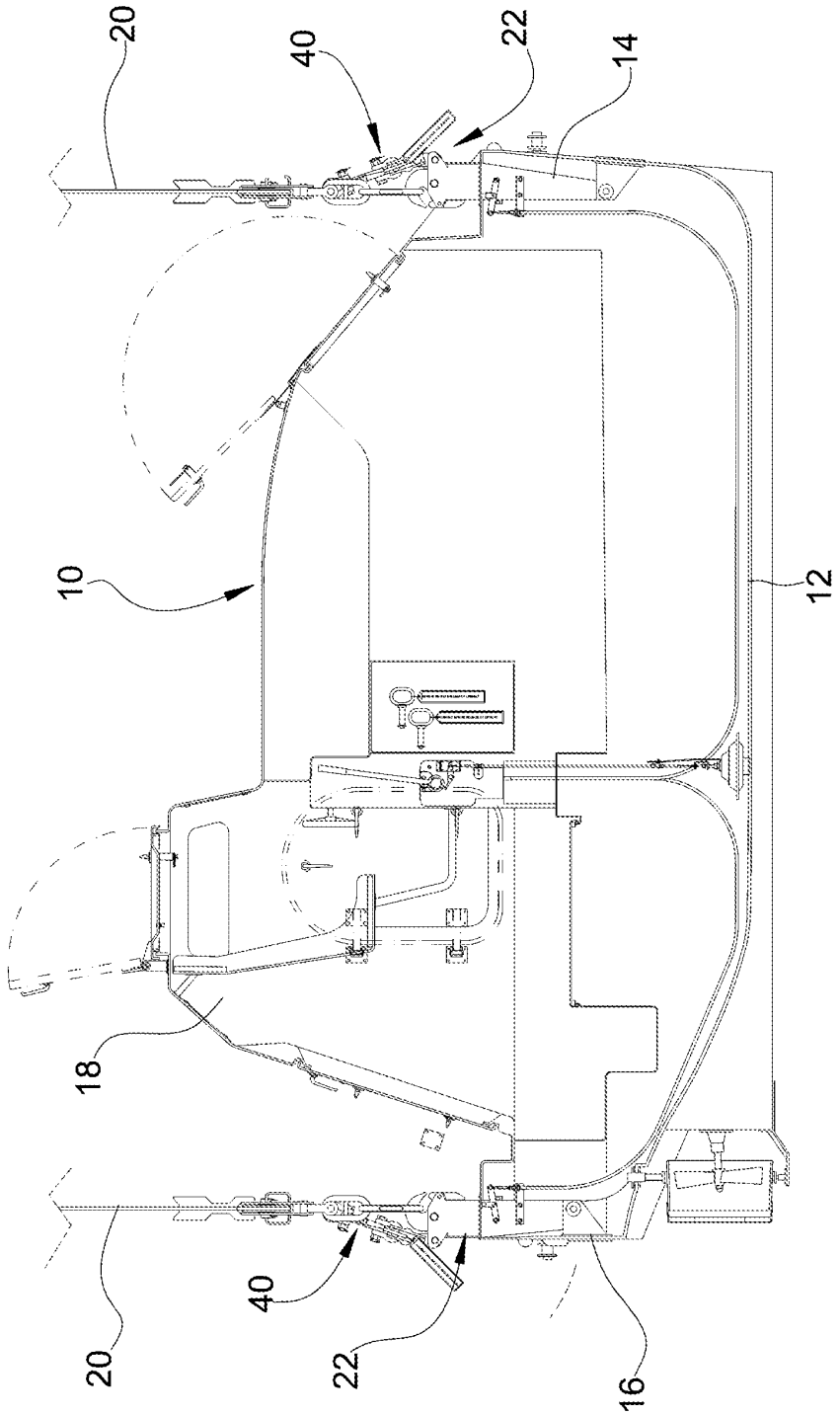


FIG 3

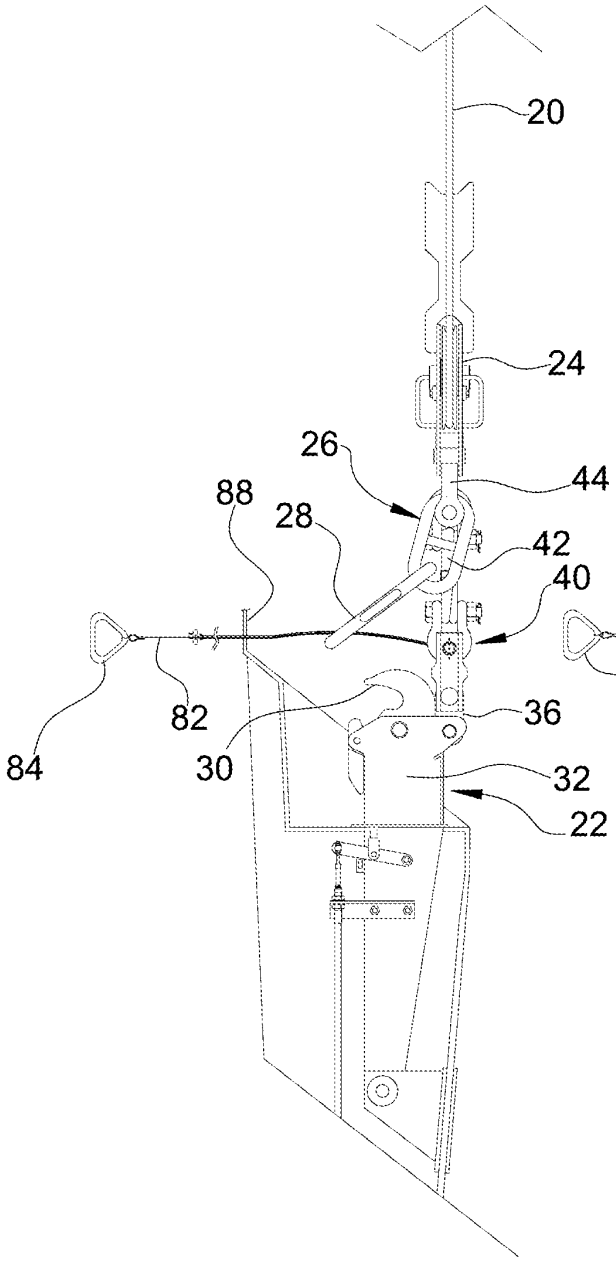

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FIG 2

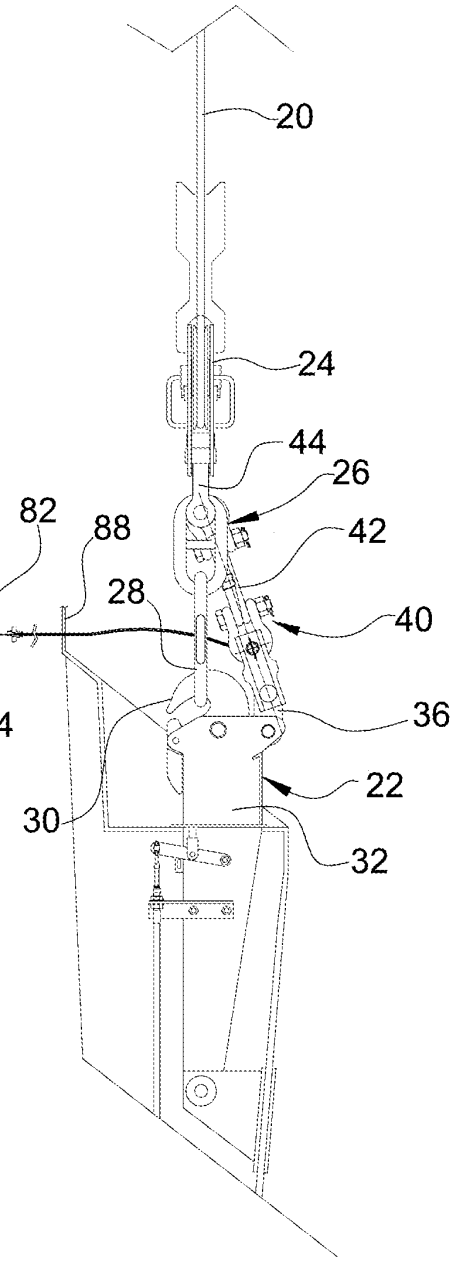

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FIG 6

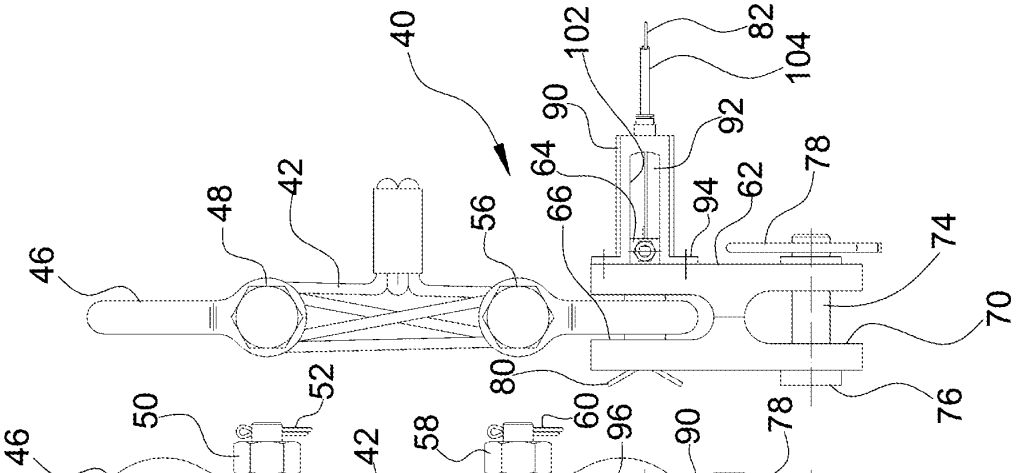


FIG 5

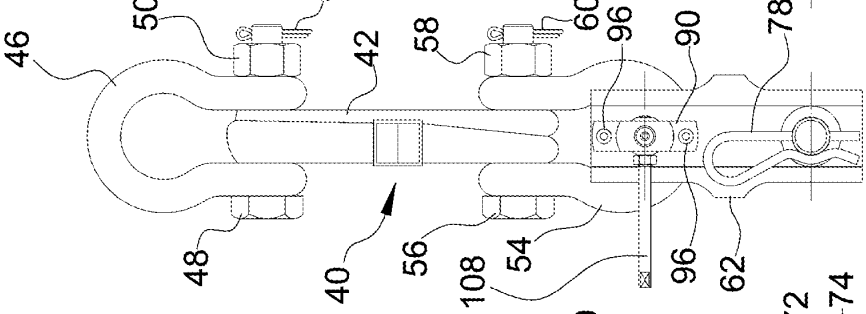


FIG 4

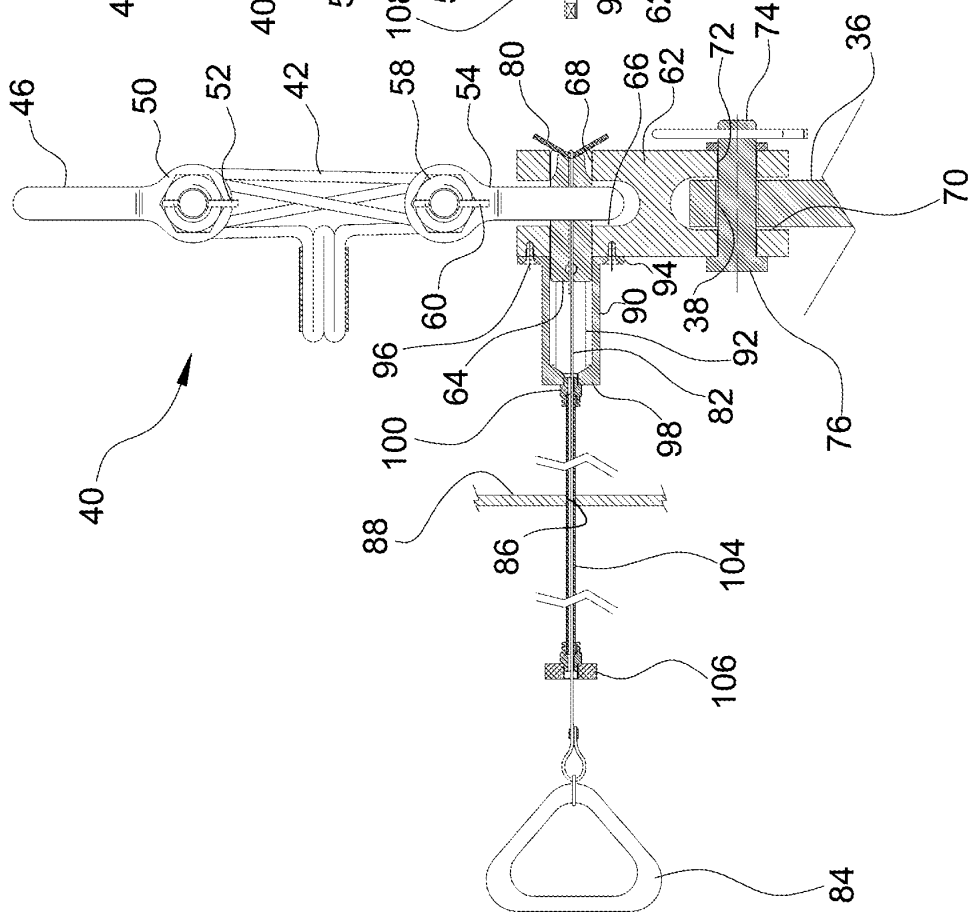
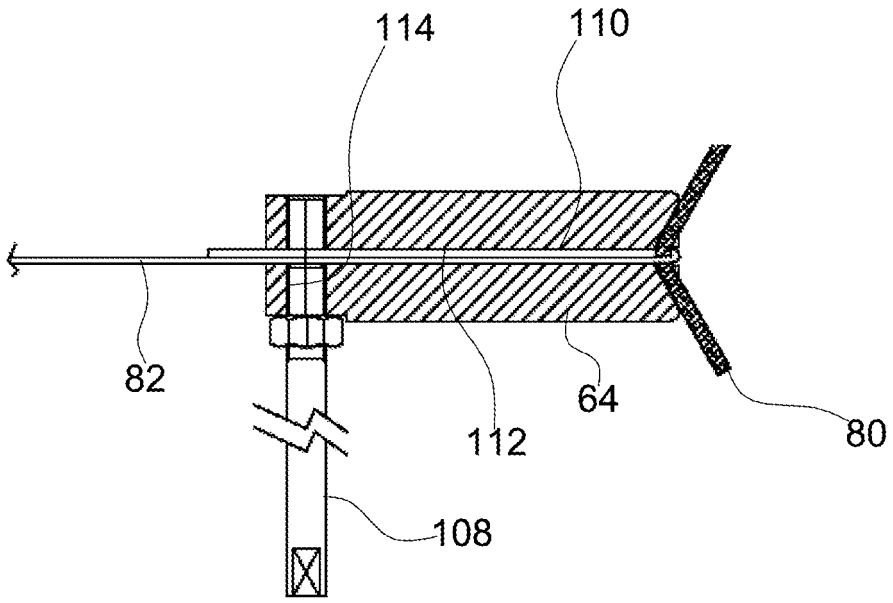


FIG 7



REFERENCES CITED IN THE DESCRIPTION

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