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(54) **SELF-LOCKING AND- RELEASING CONNECTOR GROUP FOR THE CONNECTION OF TWO COMPONENTS, AT LEAST ONE OF WHICH COMPRISES AN UNDERCUT HOLE**

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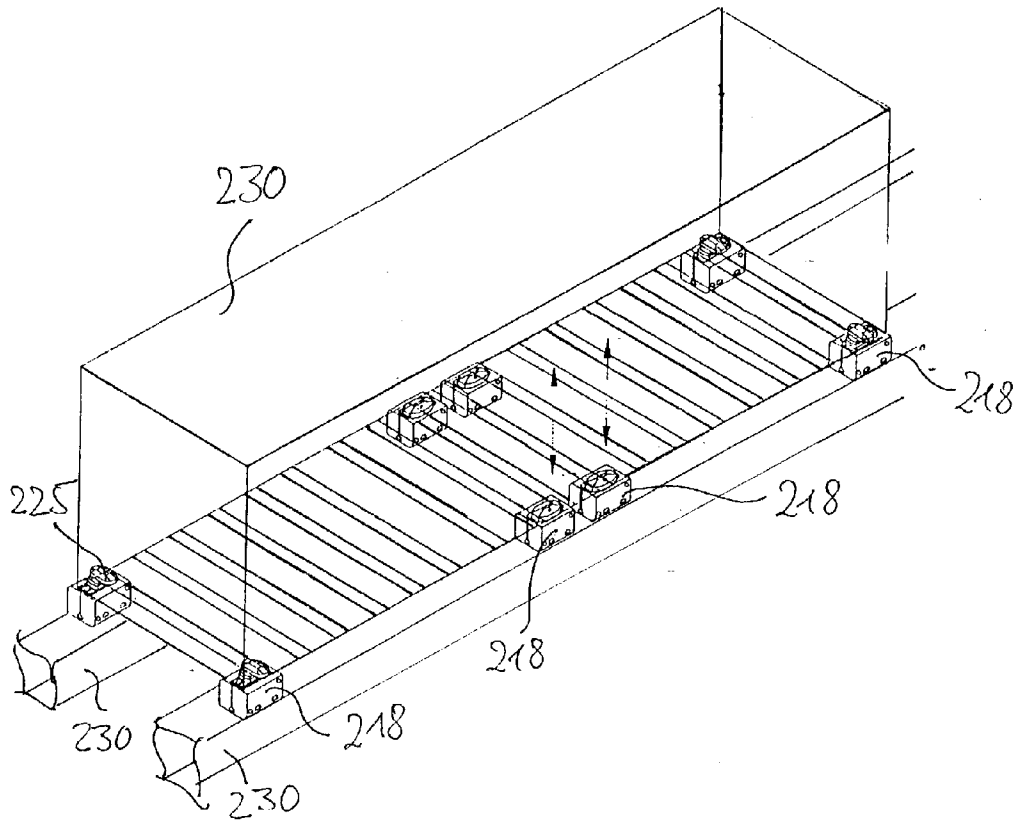
(52) **U.S. Cl.** **220/23.4**

(57) **ABSTRACT**

The invention relates to a self-locking and -releasing connector group, for the connection of two components, at least one of which comprises a hole for the partial introduction of the connector group and which is preferably a corner fitting on a sea freight container. Said group comprises a housing **(2)**, at least one locking component **(170)**, which can be displaced back and forth between a released position and a closed position, a stop component, displaceably mounted on the housing, whereby the housing may be fixed to one of the components and the locking component, in the released position thereof, may be inserted in the hole of the other component, during the relative manoeuvring of the components to be fixed together. Said stop component is moved, relative to the housing, by the other component during further relative manoeuvring of the components, which moves the locking component from the released position into the locked position, in which it engages with the undercut in the longitudinal hole, thus locking the two components together. The group further comprises a locking device **(182)**, which prevents a displacement of the locking component **(170)**, from the locked position into the released position, on a separation of the two components which are locked together, when the above are accelerated above a certain level and/or displaced from the rest position.



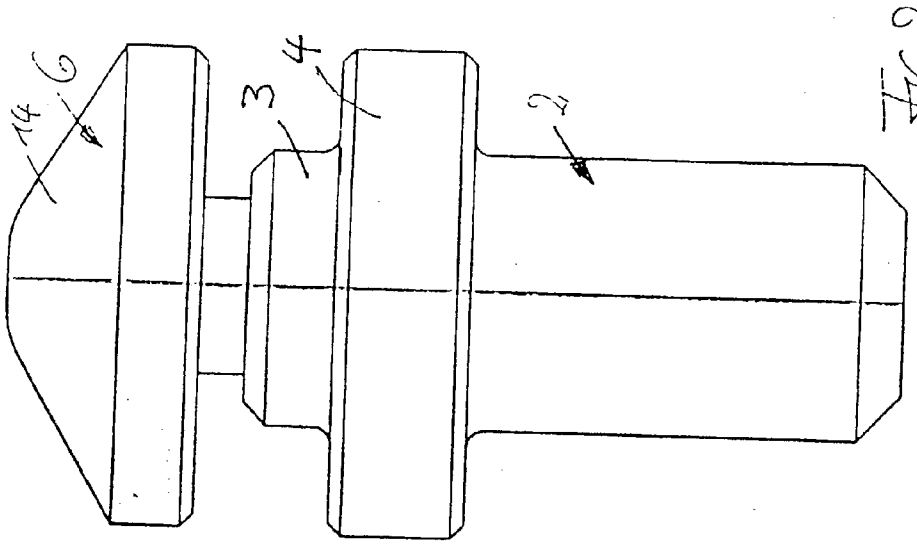


FIG 2

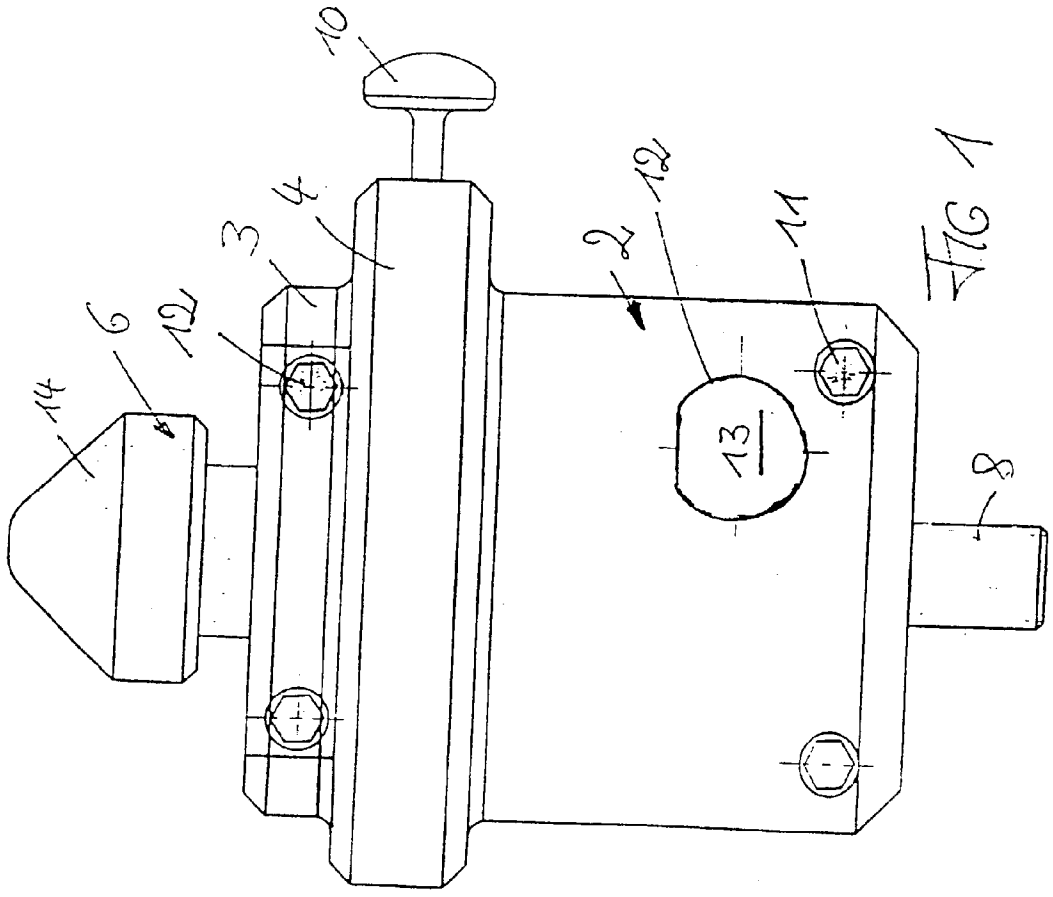


FIG 1

FIG 4

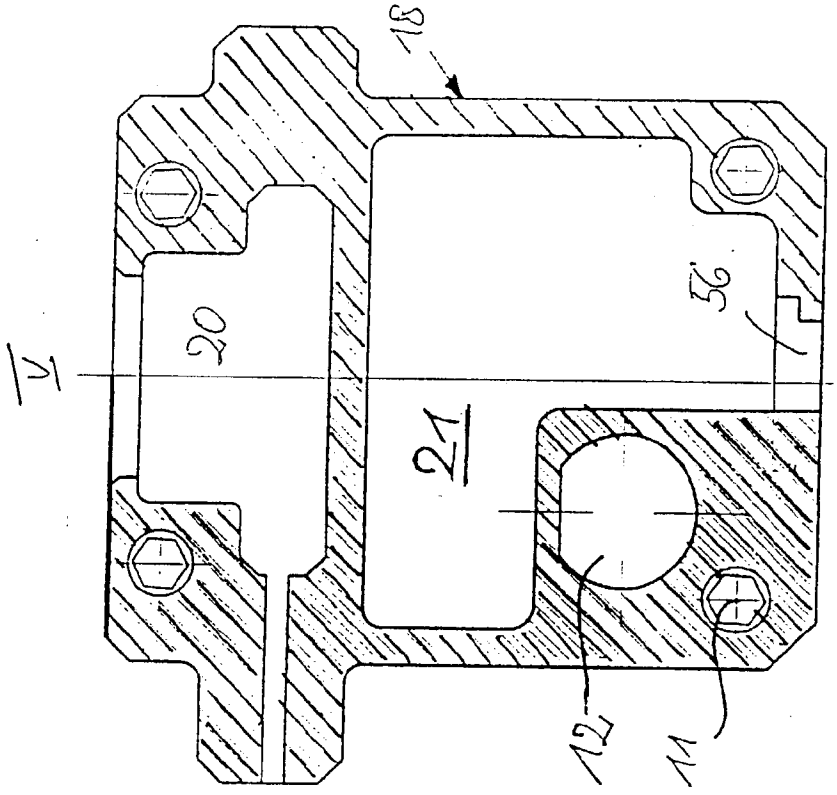
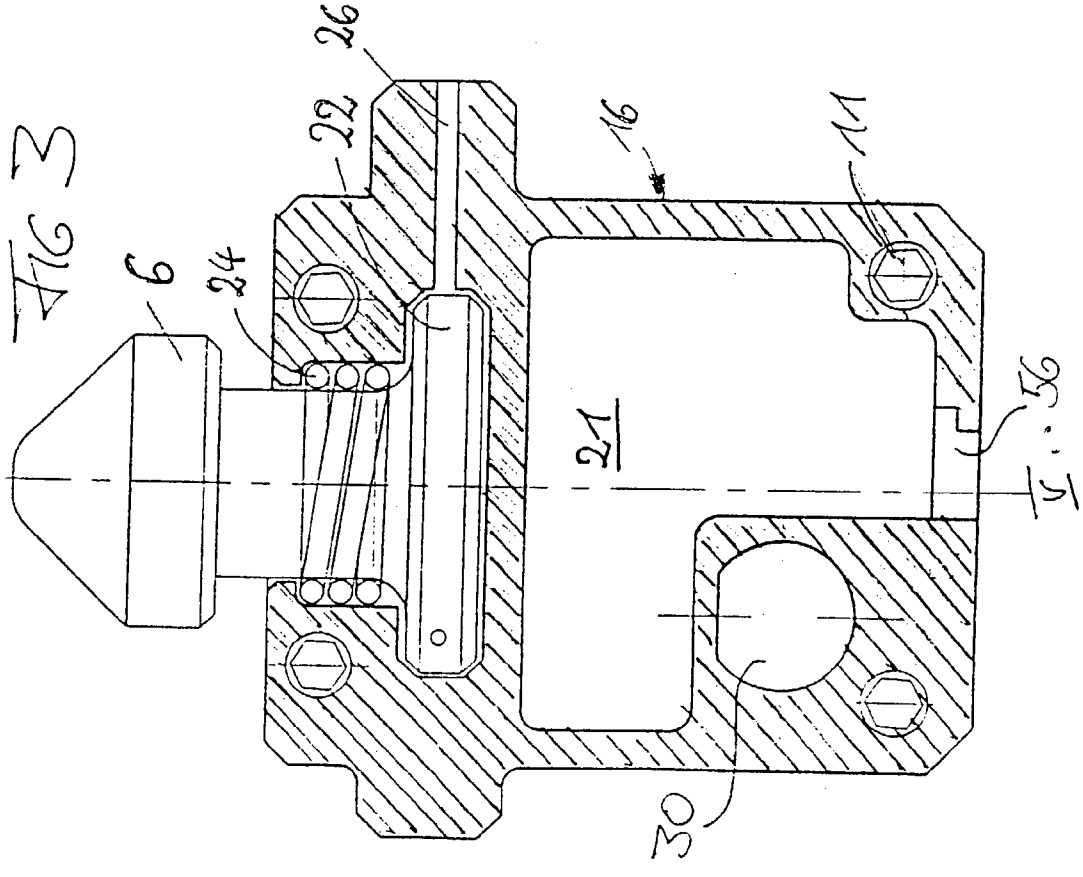


FIG 3



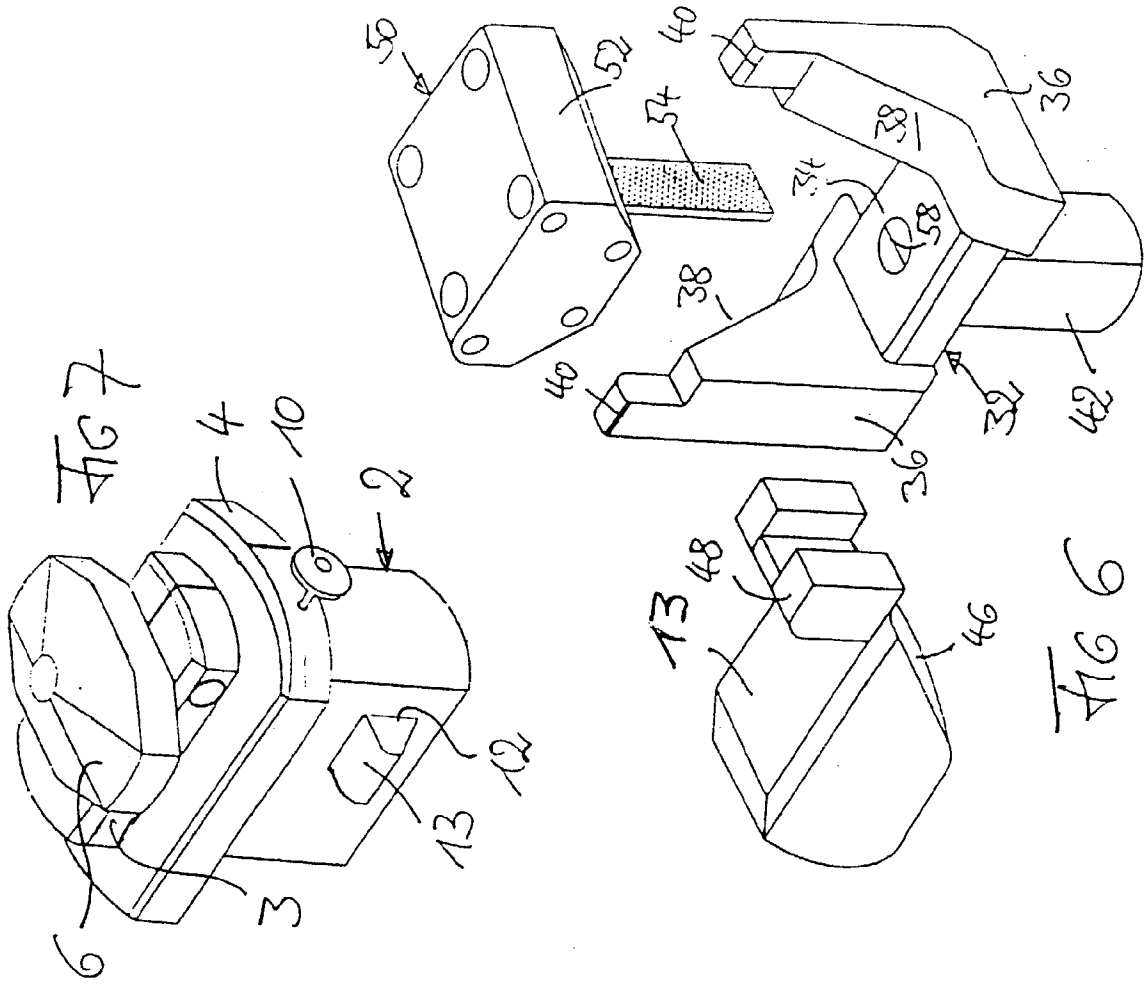

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FIG 7
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FIG 6
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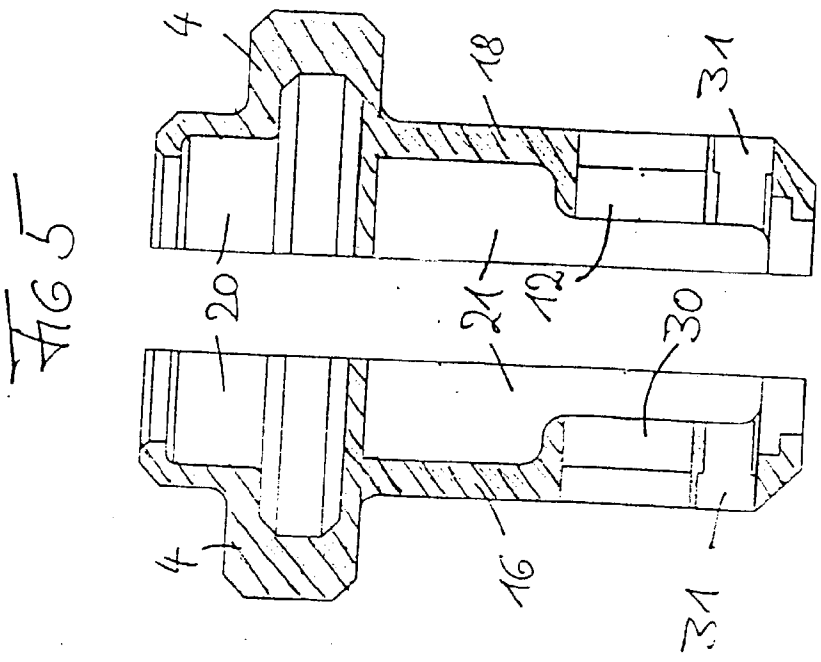
FIG 5
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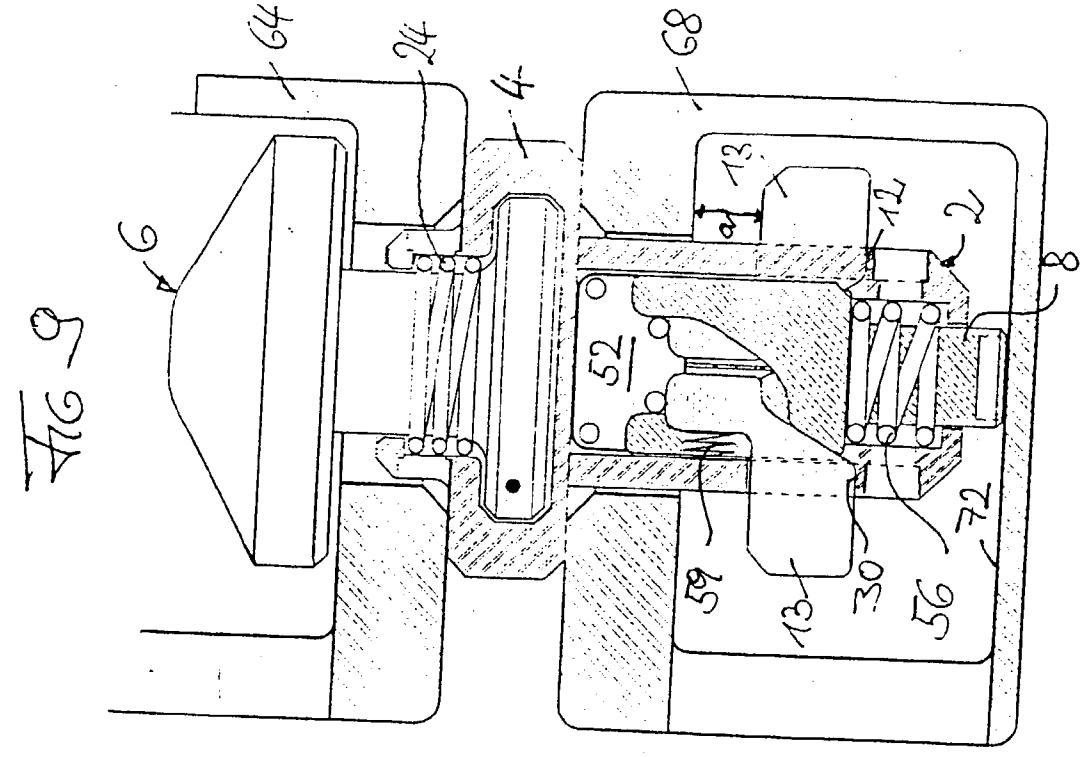
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FIG 9A

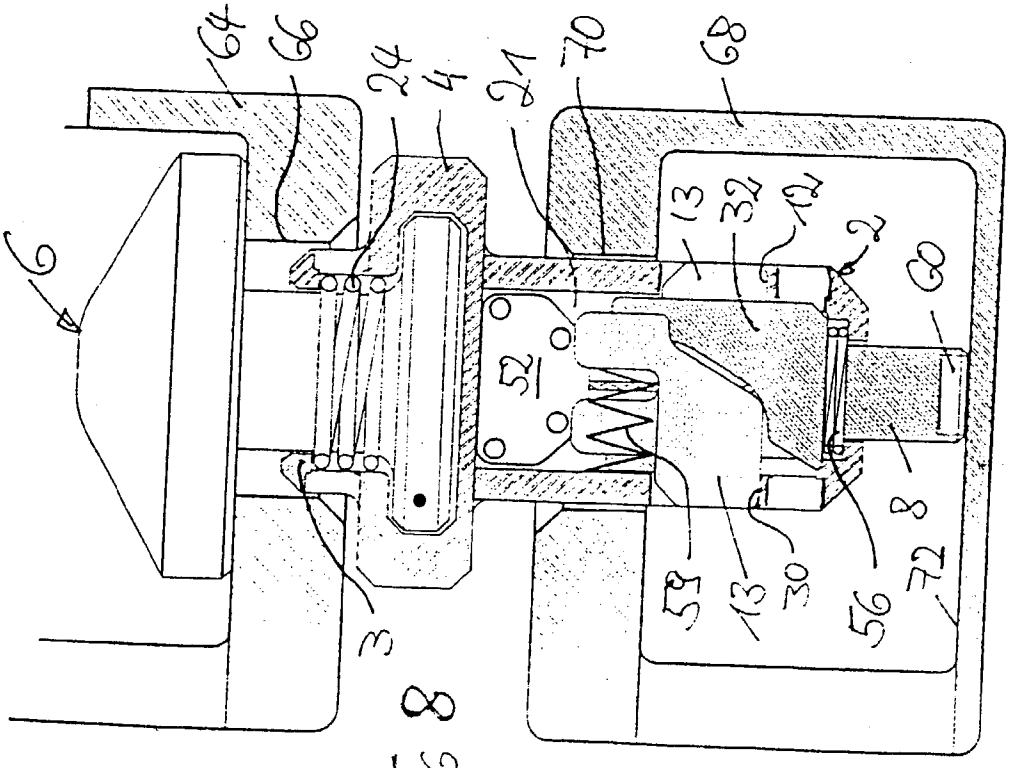
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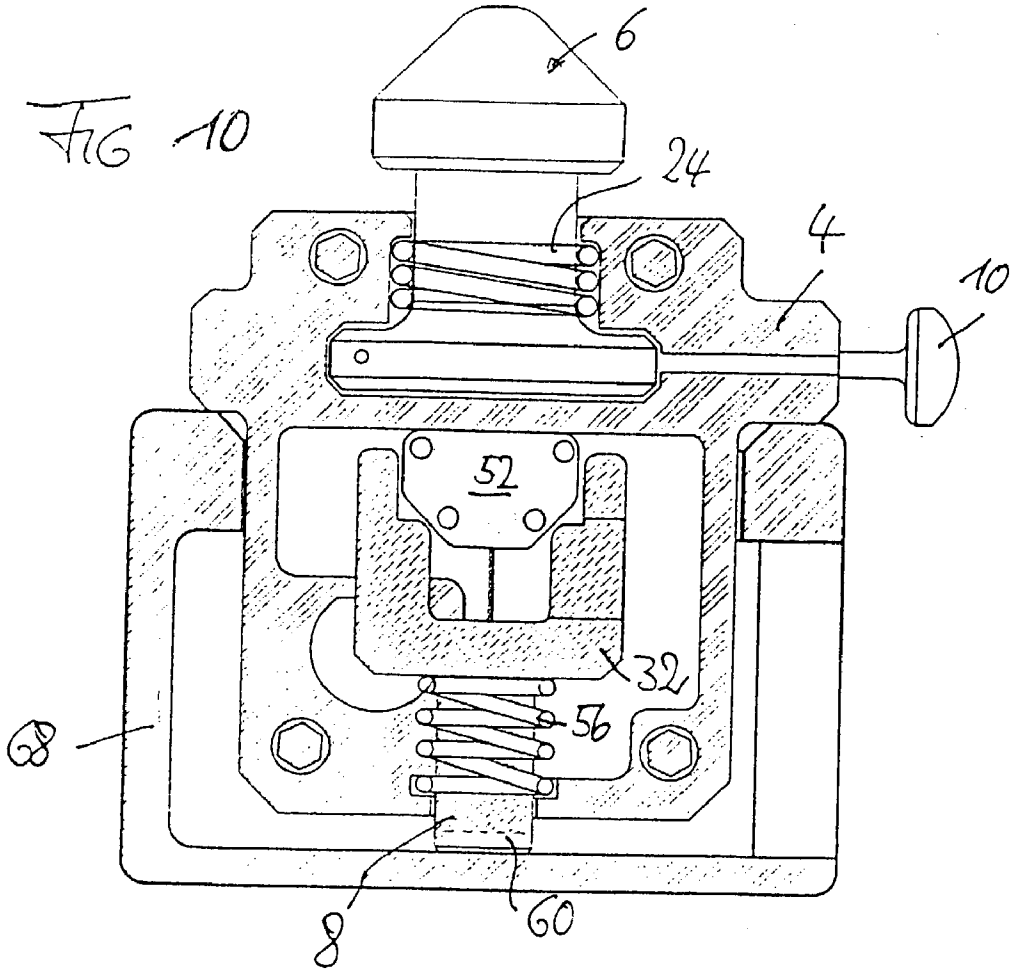
FIG 9A

FIG 10



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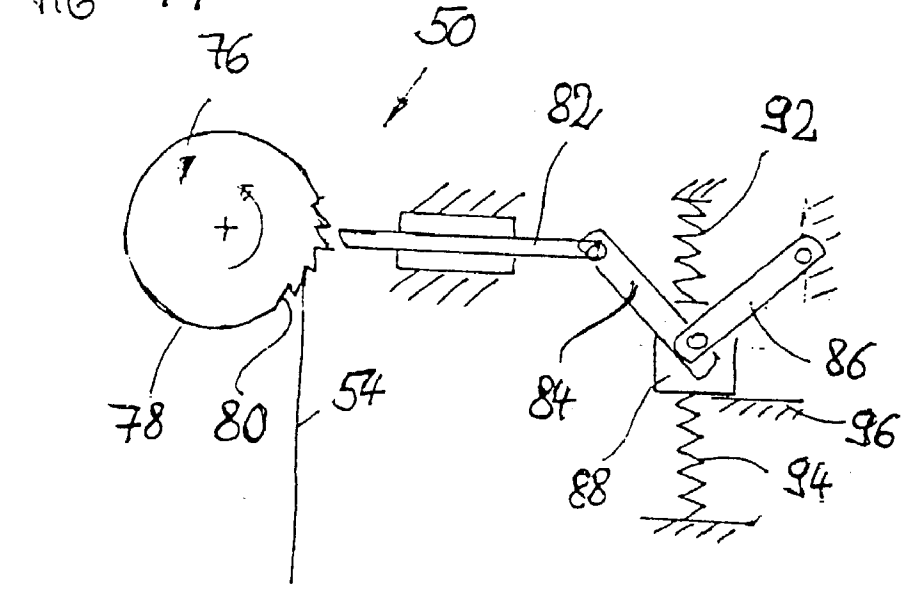

FIG 13

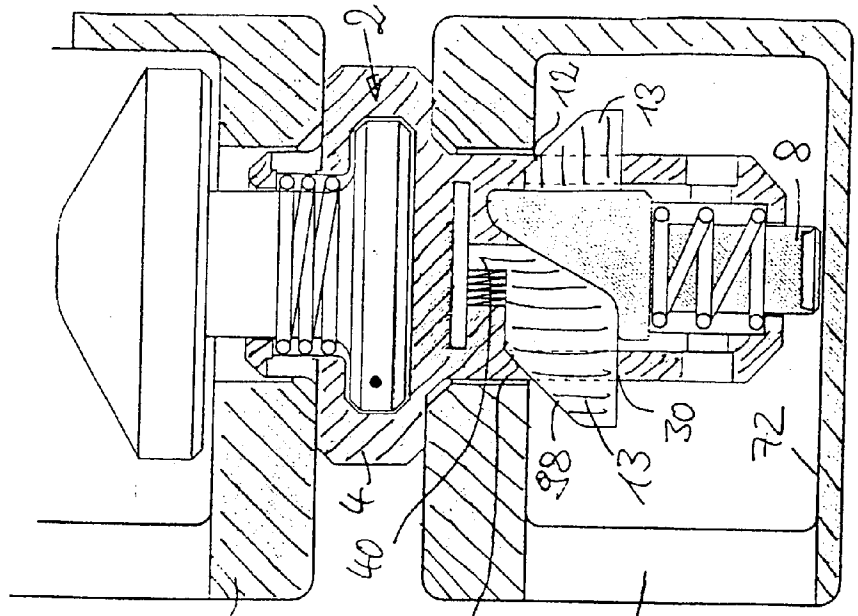
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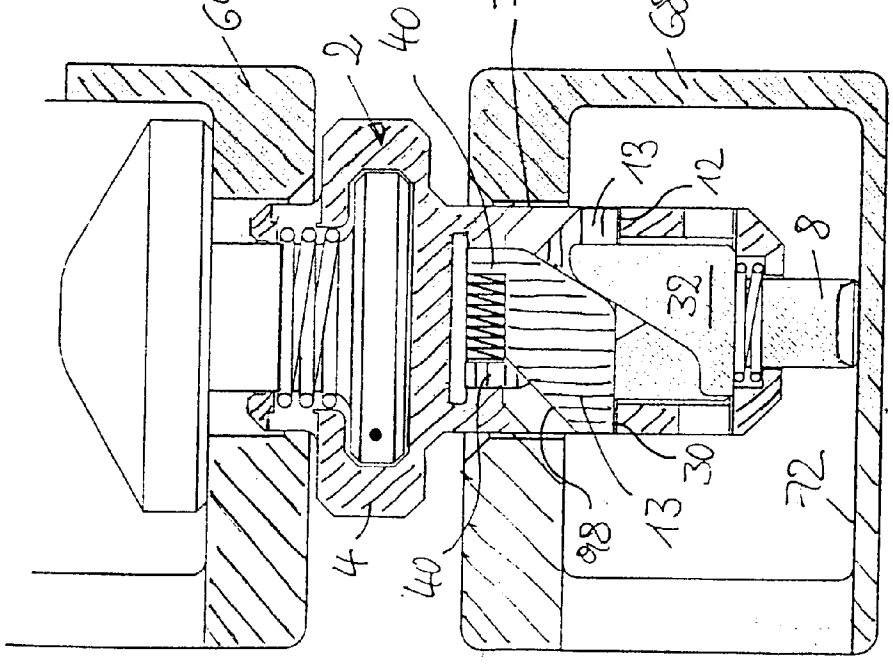
FIG 12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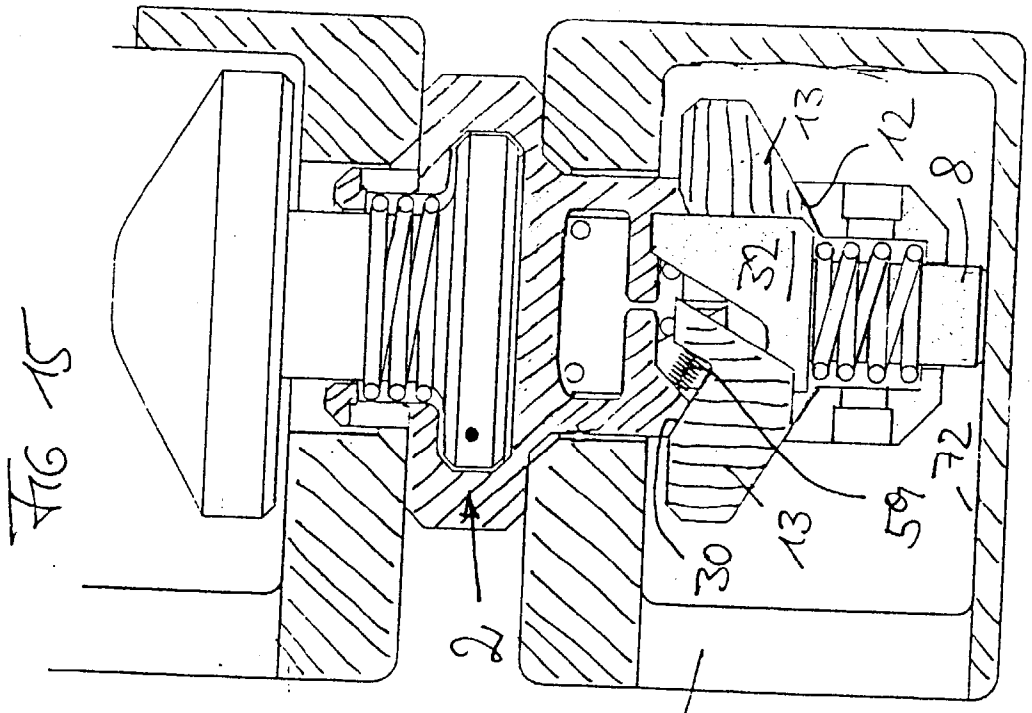

FIG 15

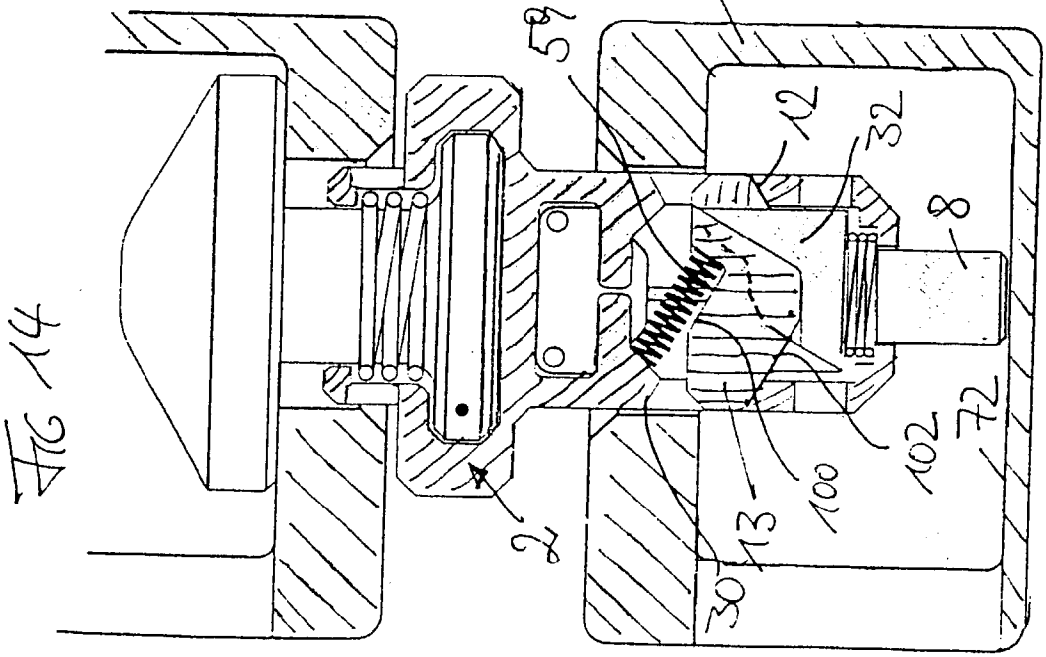

FIG 14

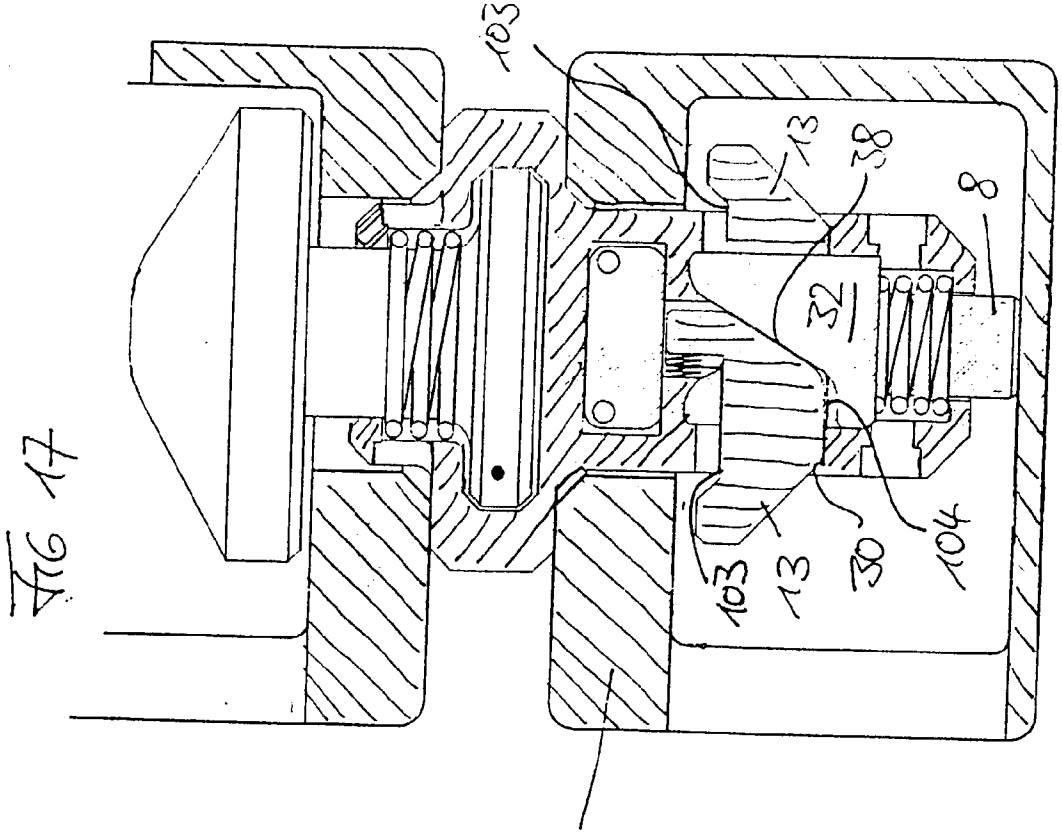

Fig 17

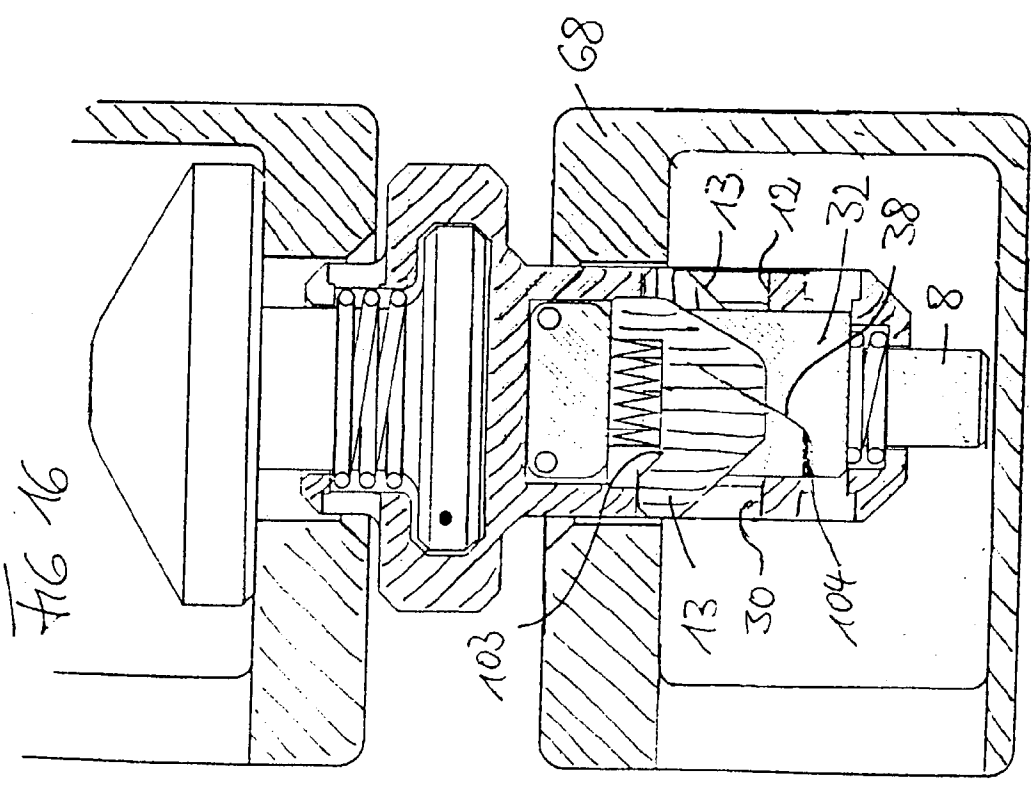

Fig 16

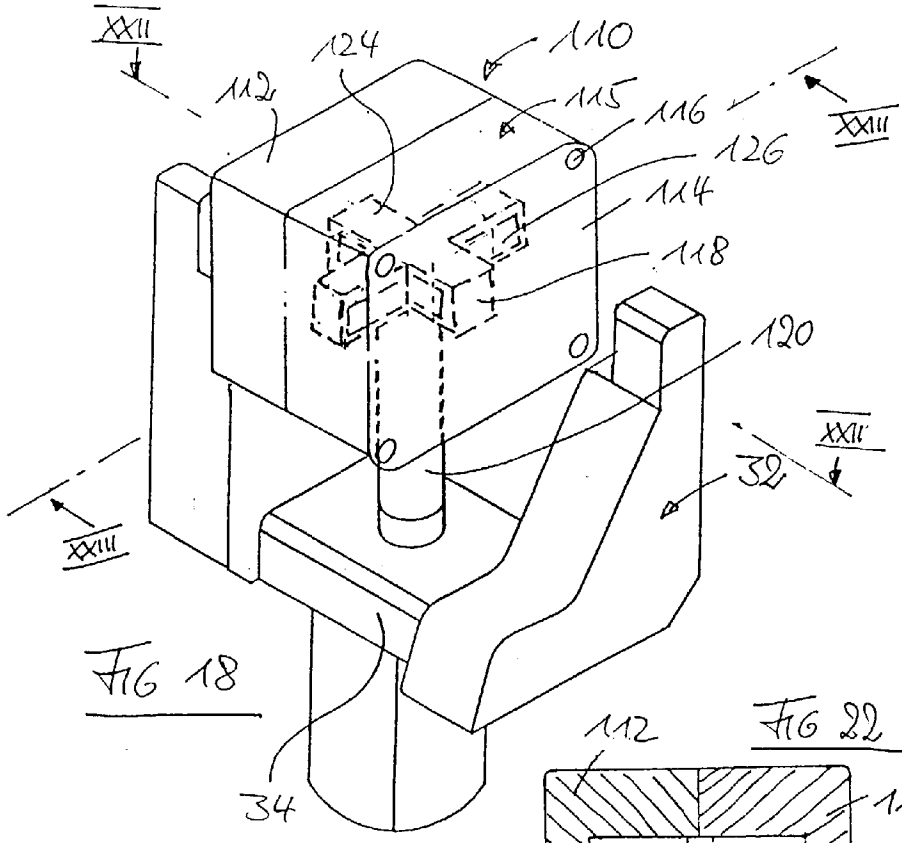

FIG 18

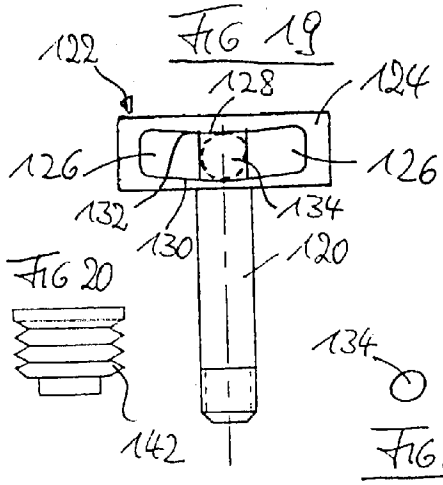

FIG 19

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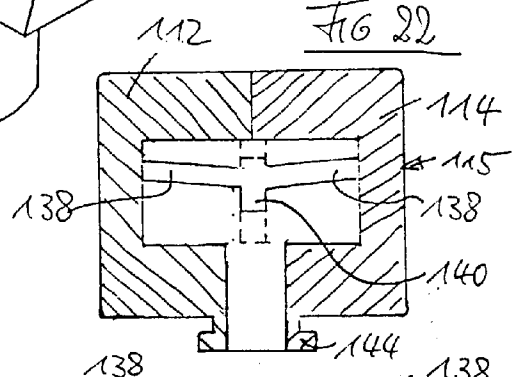


FIG 22

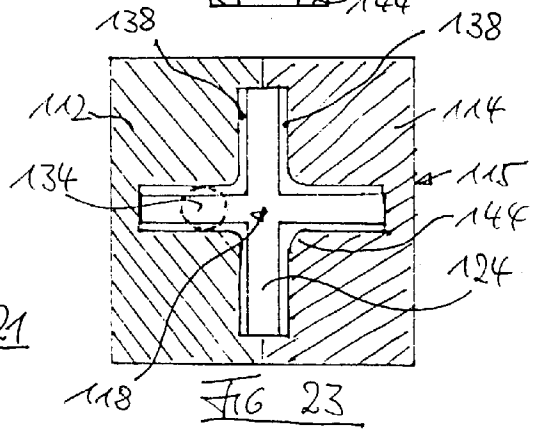


FIG 23

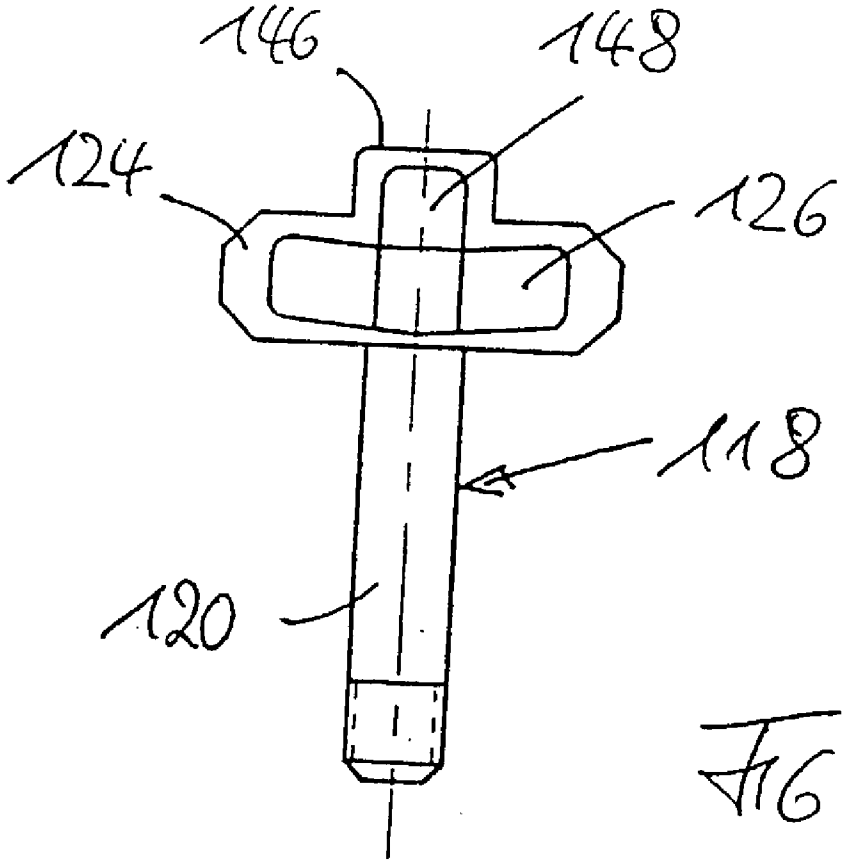


FIG 24

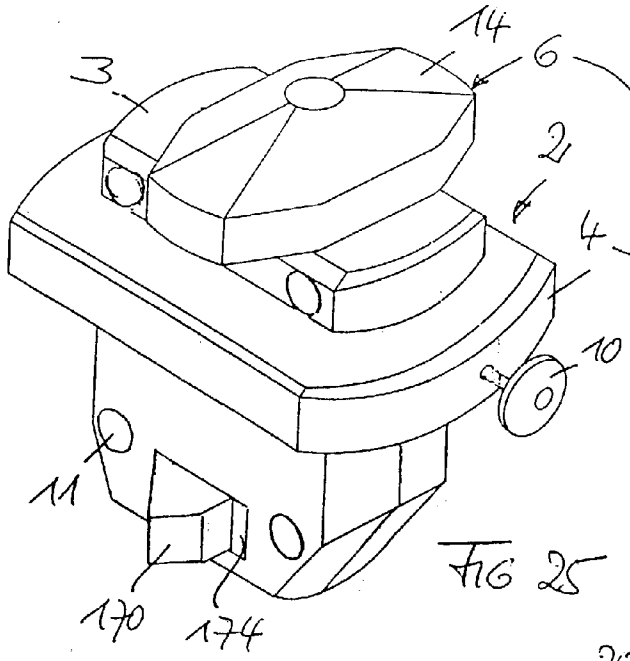


FIG 25

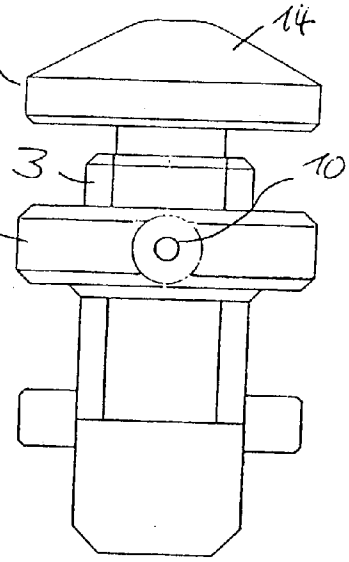
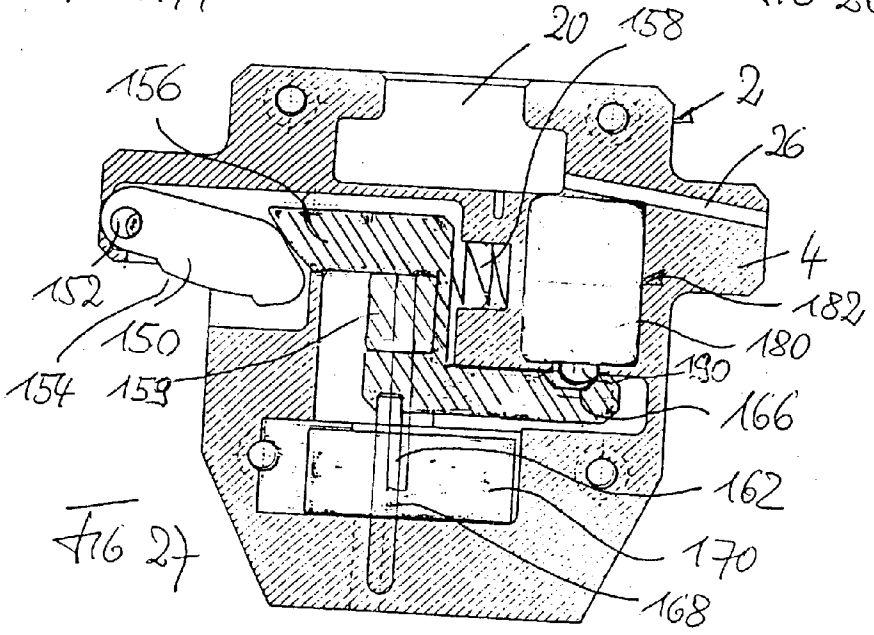


FIG 26



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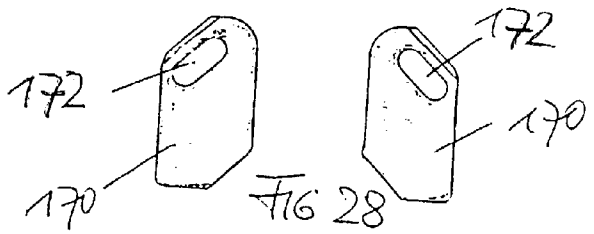

FIG 28

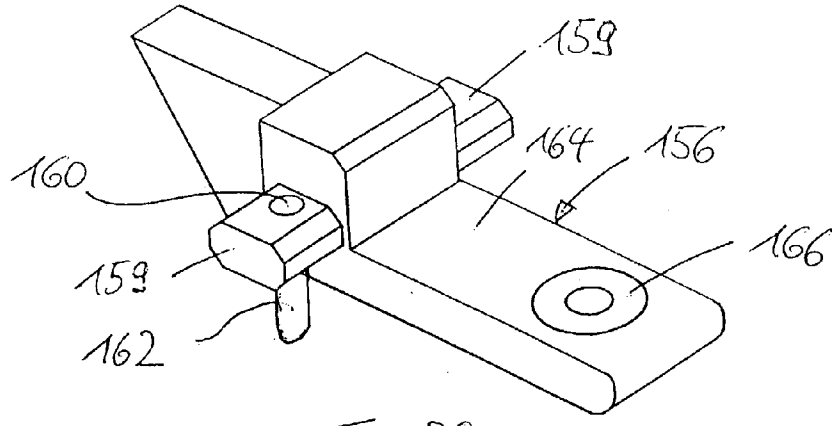

FIG 29

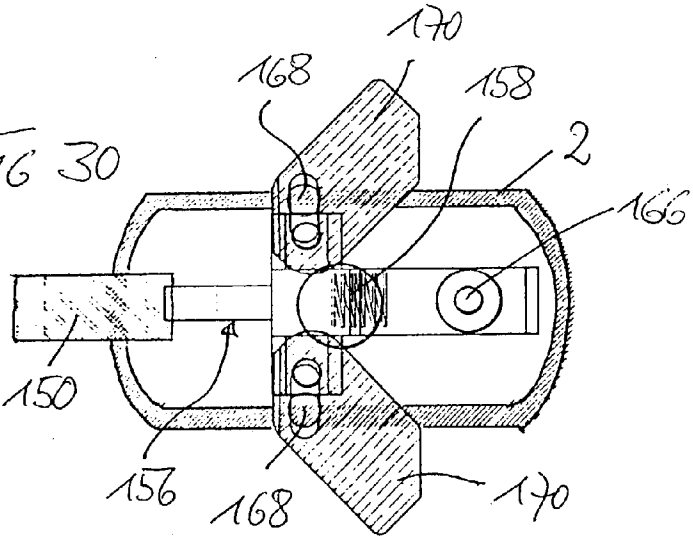

FIG 30

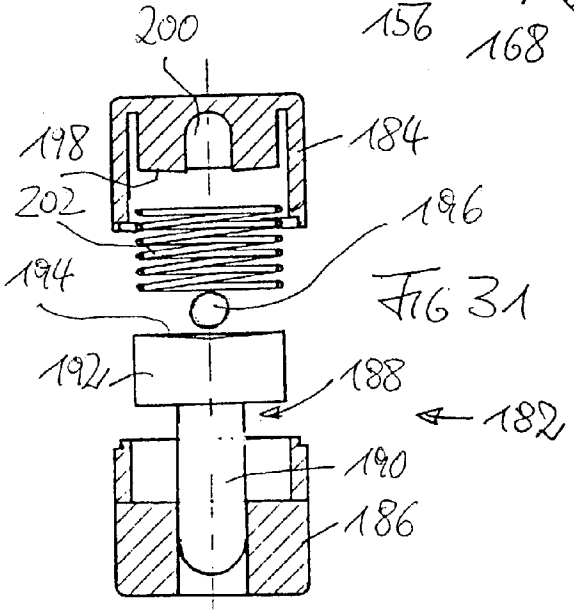

FIG 31

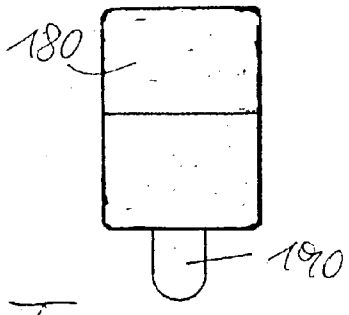

FIG 32

FIG 33

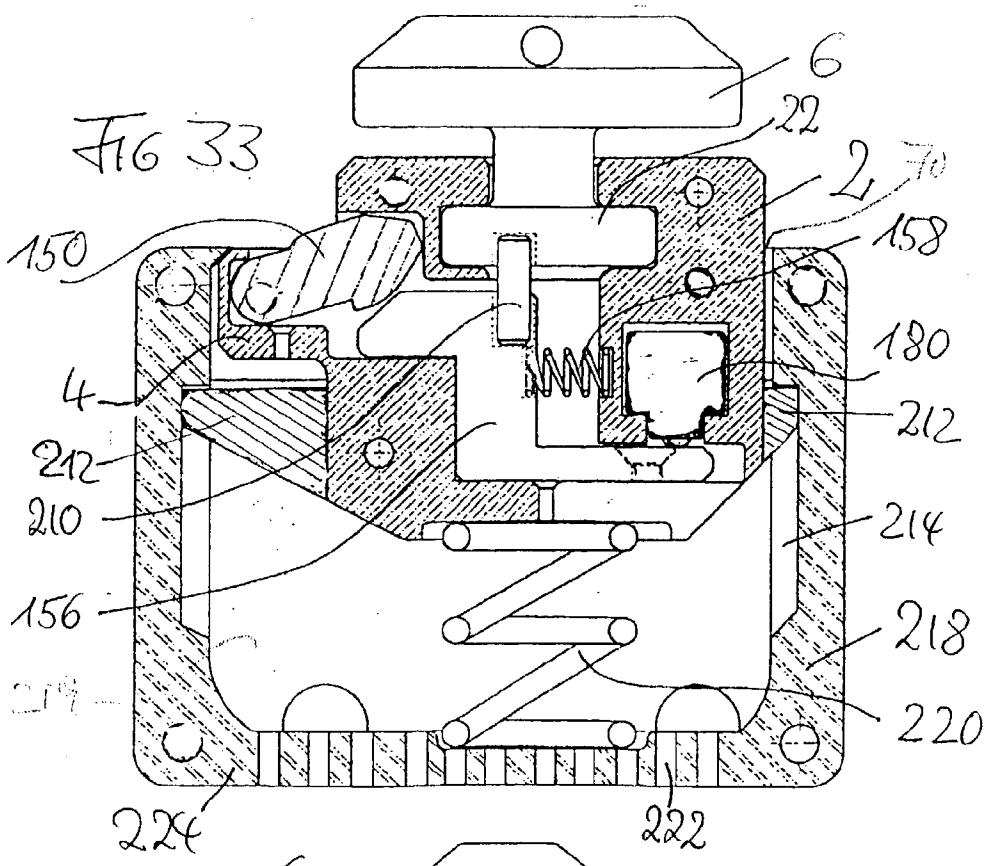
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FIG 34

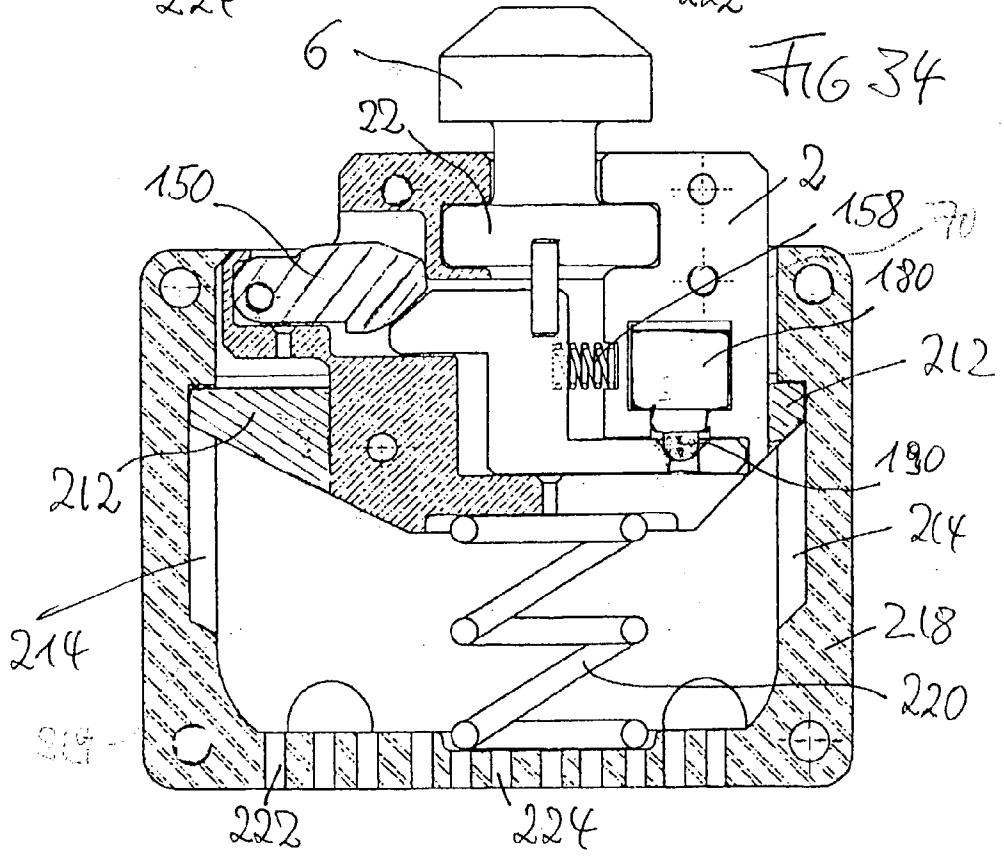
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FIG 35

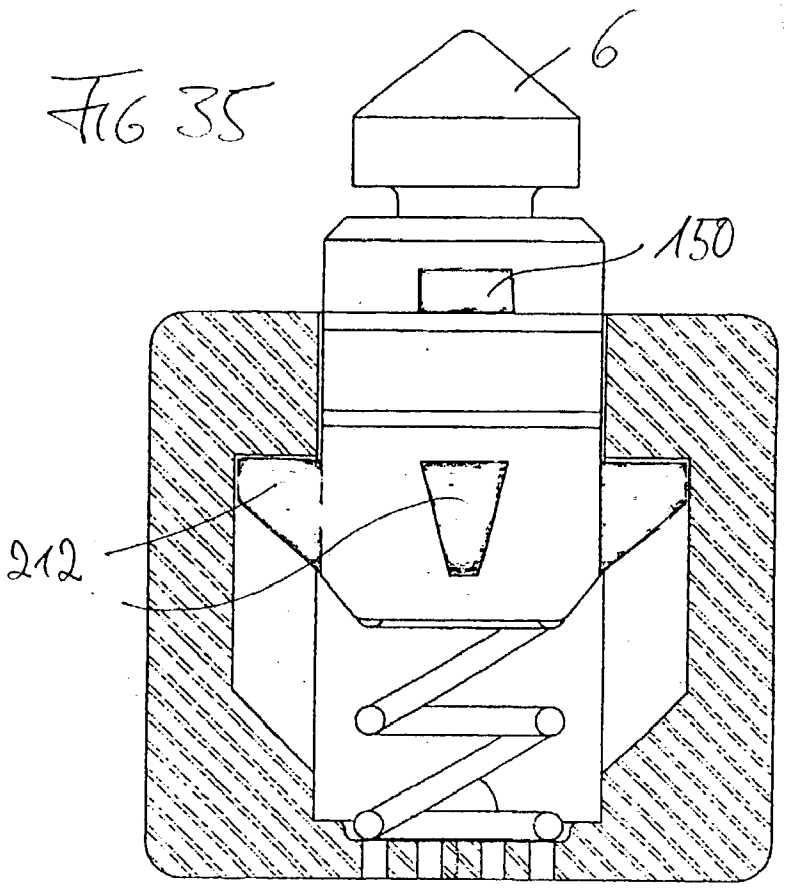
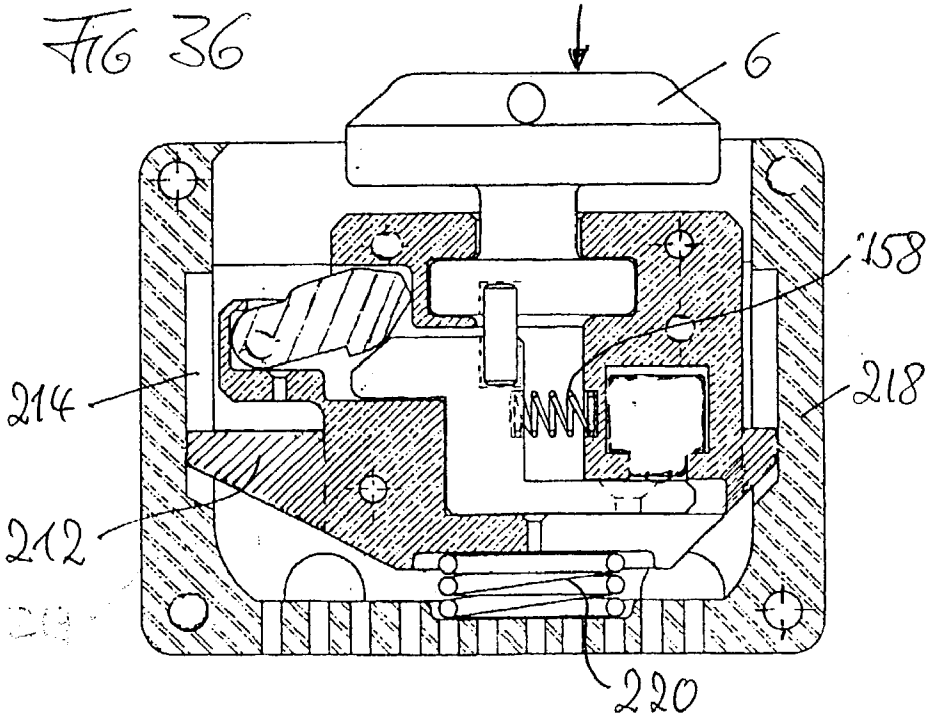


FIG 36



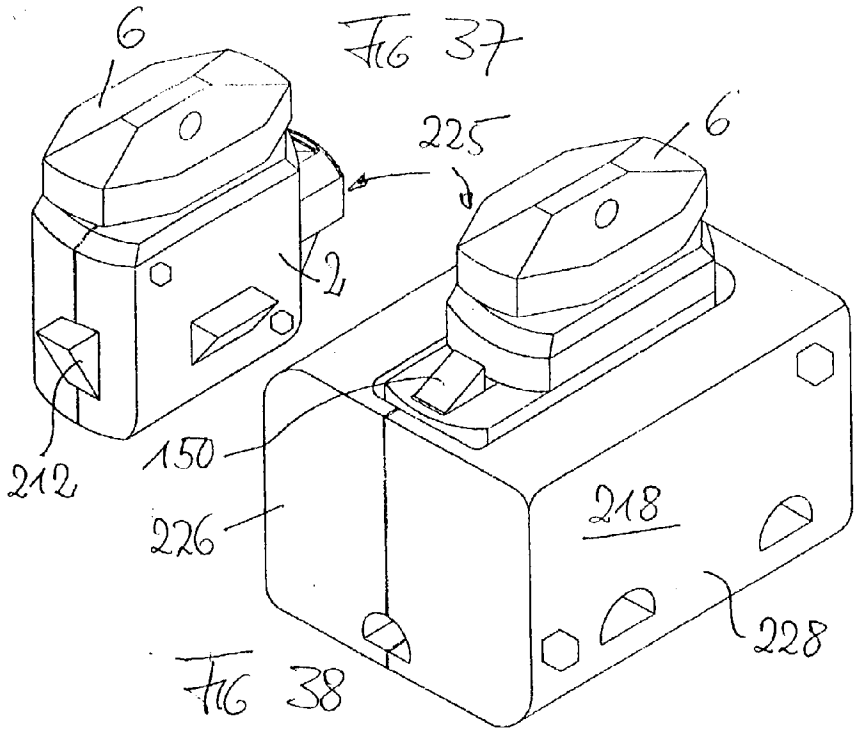


FIG 37

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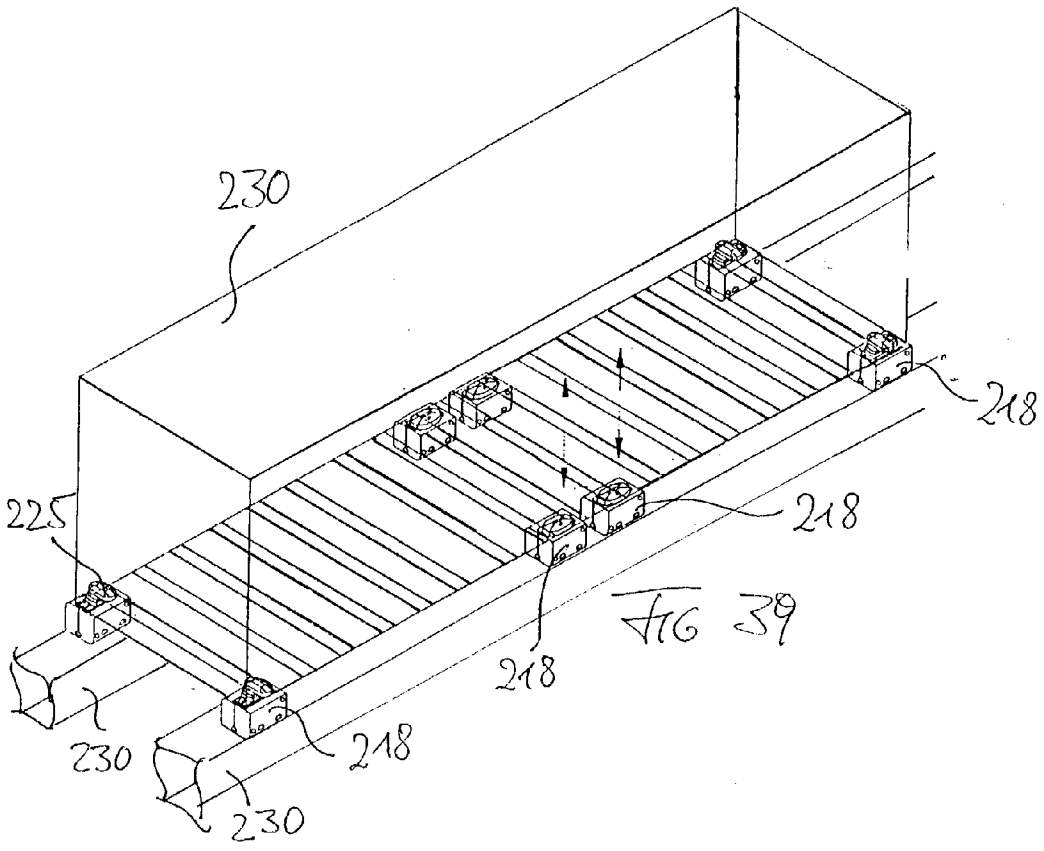

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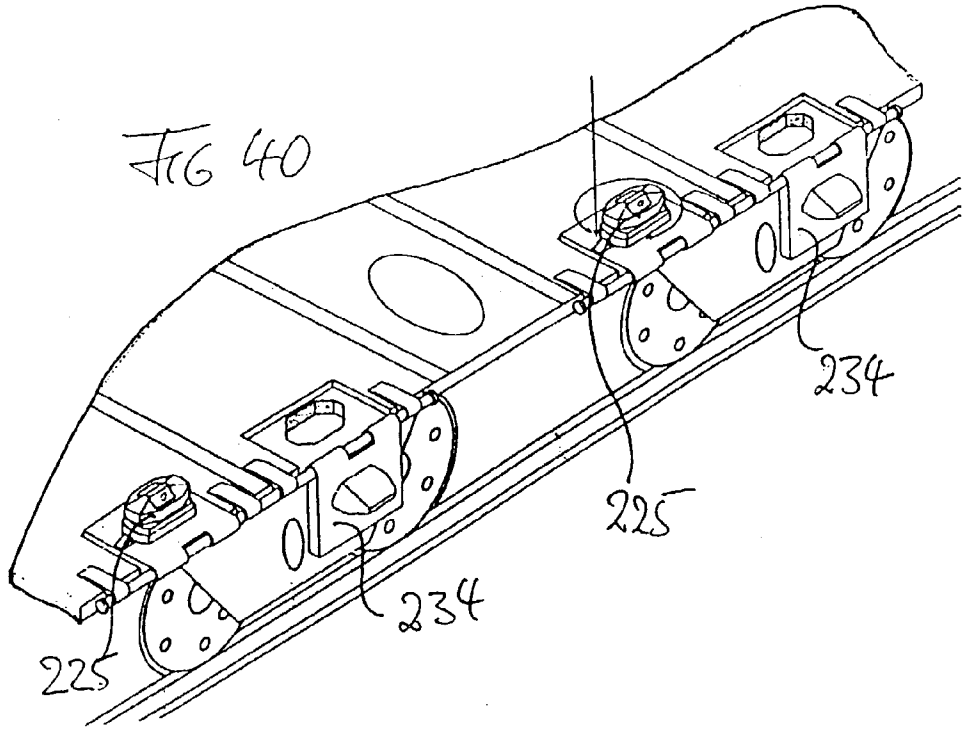


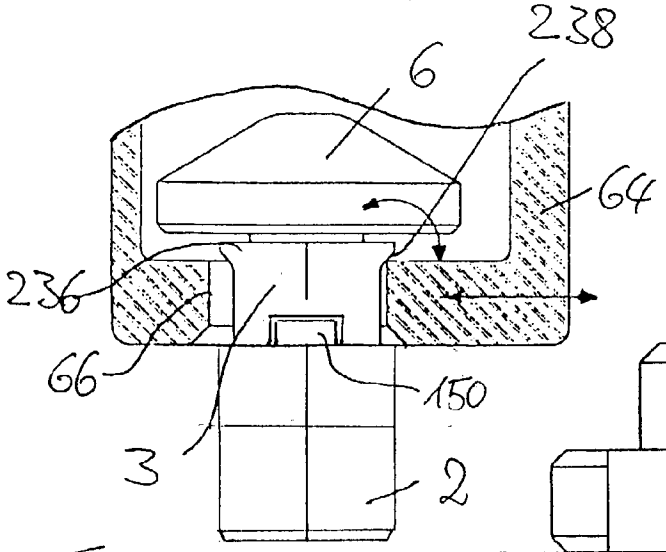
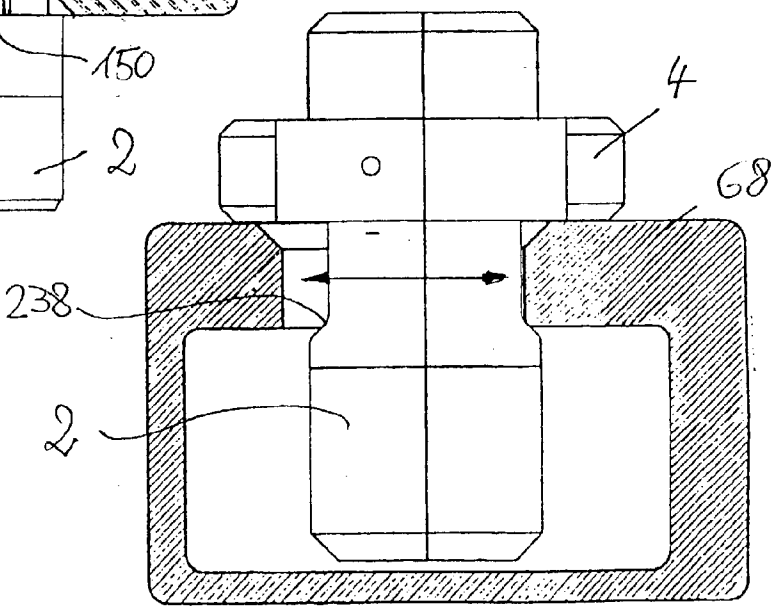


FIG 41

FIG 42



SELF-LOCKING AND- RELEASING CONNECTOR GROUP FOR THE CONNECTION OF TWO COMPONENTS, AT LEAST ONE OF WHICH COMPRISES AN UNDERCUT HOLE

[0001] The invention relates to a self locking and self releasing connector group for the connection of two components, at least one of which comprises an undercut hole for partial insertion or introduction of the connector group and which is preferably a corner fitting of a sea freight container.

[0002] Sea freight containers are transported on ships in several loading dispositions one over another. In order to ensure that the containers do not slide during sea travel, the containers must be reliably secured to one another. In this connection, connector groups are installed in the hollow corner fittings of the containers which prevent a sideward sliding and a release of the containers on top of other containers. Such connector groups are configured such that they must be manually released to effect unloading of the containers, in that, for example, a hammerhead which extends through a longitudinal hole in a corner fitting is turned in such a manner that the hammerhead no longer under grips the longitudinal hole and releases the container for lift off movement thereof by means of a crane. This manual release of the component groups is not only tiresome, as the containers are stacked in stacked dispositions up to ten high, but is, as well, dangerous because the container handling occurs at high elevations between tightly stacked containers on a ship deck.

[0003] DE 43 07 781 C2 proposes a container coupling which is designed to solve the above-noted problem. This container coupling comprises a housing having a through opening and comprised of several housing components, whereby a locking bolt is rotatably mounted in the through opening on whose end outside of the housing an asymmetrical transverse lock is arranged which is movable in a corner fitting of a container alternately between a locking position and a release position. The locking bolt is mounted on a ball movable along an inclined path in a housing component in such a manner that the locking bolt during sideward inclination or leaning of a ship assumes a locking position, in that the locking bolt under grips both corner fittings for a securement together of the containers stacked on one another, and during an upright ship movement, assumes its release position in which it releases the containers from one another for removal of the containers.

[0004] A characteristic of a coupling of this conventional type is that the locking bolt must be extraordinarily stable and is substantially imposed upon, while in its disposition during a swinging movement of the ship, even if this is a relatively long movement, to necessarily follow the movement with a high sensitivity as otherwise no secure opposed retention of the containers can be assured.

[0005] The invention provides a solution to the challenge of providing a self-locking and self-releasing connector group which is deployable in multiple situations and by which the above-noted problems do not occur.

[0006] This challenge is met by the features of the principal claim.

[0007] In the inventive component group, the locking component not only moves via the force of gravity or, as the occasion arises, via its inertia, into the locking position but, rather, moves positively via the impact component which itself is moved by the large force generated by the to-be-interconnected components, which are to be moved toward one another such as, for example, sea freight containers. In this manner, it is ensured that the component groups securely and reliably interconnect the components of the connector group with one another. Furthermore, the locking component does not move each time that the connector group is moved out of its vertical position such as, for example, during swinging movement or rolling of a ship. In this manner, the long-term operational fitness is advantageously influenced. The locking device is configured with an organic component group with which the movement capability of the locking component out of the locking position can be positively locked out. This increases, in any event, the functional reliability of the connector group, whereby the locking device is substantially sealed off to the outside, is not loaded with any high forces, is correspondingly configured to react in a sensitive manner, and can lock the respective arrangements against various outside influences.

[0008] The dependent claims are directed toward advantageous embodiments and further configurations of the inventive connector group, whose advantages are made clear in the hereinafter following description.

[0009] The invention can be deployed in numerous settings, in which two components, at least one of which comprises an undercut hole, should be automatically interconnected with one another solely during movement of one component toward the other and which should be releasable from one another without manual manipulation of the connector group, whereby this release is only possible upon the fulfillment of predetermined conditions relating to the loading and/or the movement of at least one of the connector group components. The invention is not only suitable for opposed securement of containers stacked one upon another but, instead, is also suitable for containers situated adjacent to one another which are to be interconnected with one another, on a railroad car, a loading platform, and so forth having other components provided with suitable holes, such as carriers, building elements, and so forth.

[0010] The invention is further described in the following schematic drawings and is described in connection with further details thereof.

[0011] **FIG. 1 a** side view of a connector group,

[0012] **FIG. 2 a** front view of the connector group,

[0013] **FIG. 3 a** view of a lower shell of a housing,

[0014] **FIG. 4 a** view of an upper shell of the housing,

[0015] **FIG. 5 a** sectional view through the upper shell and the lower shell of the housing shown in **FIGS. 3 and 4**, taken vertically through the views shown in **FIGS. 3 and 4**,

[0016] **FIG. 6 a** perspective view of components comprised in the housing,

[0017] **FIG. 7 a** perspective view of the connector group,

[0018] **FIGS. 8 and 9** side views of the connector groups in various functional conditions,

[0019] **FIG. 10** the side view of the view shown in **FIG. 9** turned about an angle of 90 degrees about a vertical axis,

[0020] **FIG. 11 a** sketch for explaining the function of a locking device,

[0021] **FIGS. 12 and 13** side views of a second embodiment of the connector group in two different functional conditions,

[0022] **FIGS. 14 and 15** side views of a third embodiment of the connector group,

[0023] **FIGS. 16 and 17** side views of a fourth embodiment of the connector group in two different functional conditions,

[0024] **FIG. 18 a** perspective view of a modified embodiment of a locking device built together with a locking component with an interior portion thereof revealed in broken lines,

[0025] **FIG. 19 a** view along the locking direction of the tappet comprised in the locking device shown in **FIG. 19**, in sectional view,

[0026] **FIG. 20 a** bellows comprised in the locking device,

[0027] **FIG. 21 a** ball,

[0028] **FIG. 22 a** vertical sectional view through a locked housing, taken along the plane XII-XII of **FIG. 18**,

[0029] **FIG. 23 a** horizontal sectional view through the locking device shown in **FIG. 18**, taken along the plane XIII-XIII of **FIG. 18**,

[0030] **FIG. 24 a** modified embodiment of a tappet,

[0031] **FIG. 25 a** perspective view of a modified embodiment of a connector group,

[0032] **FIG. 26 a** front view of a connector group as shown in **FIG. 25**, **FIG. 27 a** longitudinal sectional view through the connector group as shown in **FIG. 25**,

[0033] **FIG. 28 a** view of two locking components,

[0034] **FIG. 29 a** perspective view of a slide,

[0035] **FIG. 30 a** schematic transverse sectional view through the group shown in **FIG. 25**,

[0036] **FIG. 31 a** locking device in an exploded view,

[0037] **FIG. 32 a** locking device in side view,

[0038] **FIG. 33 a** side view of an embodiment modified relative to the embodiment shown in **FIG. 25** in released condition,

[0039] **FIG. 34 a** side view of the group shown in **FIG. 33** in locked condition,

[0040] **FIG. 35 a** rear view of the group shown in **FIG. 33** with a separated receipt element,

[0041] **FIG. 36 a** view corresponding to the view of **FIG. 33** with the receipt element inserted into the connector group,

[0042] **FIG. 37 a** perspective view of the connector group shown in FIGS. **33-36**,

[0043] **FIG. 38** the connector groups shown in **FIG. 37**, deployed in a receipt element,

[0044] **FIG. 39 a** perspective view for explaining an advantageous deployment of the arrangement shown in **FIG. 38**,

[0045] **FIG. 40 a** sectional view of a railroad car for deployment of the inventive connector groups similar to those shown in **FIG. 37**,

[0046] **FIG. 41** an advantageous detail of a housing of an inventive connector group and

[0047] **FIG. 42** an advantageous detail of a housing of an inventive connector group.

[0048] As seen in **FIG. 1**, the connector group comprises a housing **2** with an upper end region **3** and a flange **4**. A hammerhead **6** extends from the upper end region **3**. A tappet-like stop element **8** extends from the lower end of the housing body. A hand grip **10** extends from the flange. Bolts are designated with **11**. A through opening is designated with **12**, through which a locking slide **14** is movable, as will be described in more detail hereinafter.

[0049] **FIG. 2** is a side view of the connector group shown in **FIG. 1** shown in a front view thereof. As can be seen, a head **14** of the hammerhead **6** is not annularly shaped but, rather, has a greater extent in its front dimension than in its side dimension.

[0050] The housing **2** is put together from a lower shell **16** (**FIG. 3**) and an upper shell **18** (**FIG. 4**).

[0051] To effect the assembling together of the housing, the upper shell **18** is turned in a counter-clockwise direction through 180 degrees out of the plane of the drawing paper and set onto the lower shell **16**. Thereafter, both shells are connected with one another by threaded engagement of the bolts **11**, which are being received in corresponding holes in the housing shells.

[0052] The shells **16** and **18** together form an upper hollow space **20** and an inner space **21**. The hammerhead **6** is movably received in the upper hollow space **20** and, due to its flange **22**, is received in a contoured locking manner and in a retaining manner such that it cannot be unintentionally released. A spring **24** biases the hammerhead **6** in a predetermined locking position. The hand grip **10** (**FIGS. 1 and 2**) extends with a non-illustrated shoulder in a through channel **26** and is connected with the flange **22** via a push pull cable (not shown), so that, by pulling on the hand grip **10**, the hammerhead **6** is rotatable against the bias of the spring **24** into a release position out of which position the hammerhead, upon release of the hand grip **10**, returns to its locking position.

[0053] As can be further seen in **FIG. 3** and **4**, a through opening **30** in the lower shell **16** corresponding to the through opening **12** of the upper shell **18** is, in the illustrated example, configured such that, in the assembled-together housing, both of the through openings **12** and **30** do not coincide with one another but, instead, are arranged in mirror-image symmetry relative to the middle of the housing.

[0054] **FIG. 5** shows, in the left-hand half thereof, a vertical sectional view through the lower shell **16**, taken along the plane V-V in **FIG. 3** and, in its right-hand half, a vertical sectional view through the upper shell **18**, taken along the plane V-V in **FIG. 4**. As can be seen, the through

openings **12** and **30** are arranged at the same height. Moreover, the holes **31**, configured in the housing shells for receipt of the bolts **11** (**FIG. 1**), are visible in **FIG. 5**.

[**0055**] **FIG. 7** shows the entire connector group in perspective view, whereby the through opening **12** in the illustrated connector group is not, as in **FIG. 4**, rounded-off but is, instead, completely right angled.

[**0056**] **FIG. 6** shows three components of a connector group which is received in the inner space **21** of the housing **2**.

[**0057**] A bridge-type spread component **32** comprises a horizontal shank **34** from which two spread pieces **36**, set in opposition to one another by 180 degrees, extend outwardly, each being configured with an inclined surface **38** and a projection **40** disposed at the top. From the shank **34**, the tappet-like stop element **8** (**FIG. 1**) extends downwardly.

[**0058**] A corresponding lock slide **13** (**FIG. 1**) (only one is illustrated) works in connection with the inclined surface **38** of each spread piece, the locking slide **13** comprising an inclined surface **46** and a guide element **48**.

[**0059**] Furthermore, a locking device **50** with a housing **52** is provided in which a shaft (**FIG. 10**) is mounted onto which a band **54** is wound up. The capability of the shaft to rotate can be locked out by means of a lock mechanism in **FIG. 6** (not illustrated).

[**0060**] The assembling together of the illustrated components to comprise a complete connector group is as follows:

[**0061**] Initially, the hammerhead **6** with the spring **24** engaged thereagainst is disposed in the hollow space **20** of the lower shell **16** and the hand grip **10** is brought via a not illustrated connection into engagement with the flange **22**. Thereafter, the spread component **32** is disposed in the lower shell **16** in a manner such that the stop element **8** extends downwardly through a recess or, respectively, an opening **56** (**FIGS. 3 and 4**) outwardly of the lower shell **16**. In this condition, a spring **56** (**FIG. 8**) is deployed between the shank **34** and the lower shell **16** or, respectively, a later installed housing. Thereafter, one of the locking slides **13** is disposed in the lower shell **16** in a manner such that it extends into the through opening **30**. In this condition, a spring **59** (**FIG. 8**) is installed between the guide element **48** of the locking slide **13** and the lower shell **16**. Furthermore, a locking device **50** is disposed in the housing **52** in, for example, a corresponding recess in the lower shell **16** (not shown), so that it is received therein in a fixed manner, and the band **54** is secured at **58** (**FIG. 6**) to the shank **34**. Then, the other locking slide is inserted in the through opening **12** of the upper shell **18** by deployment of an additional spring **59** (not shown) between the guide element of this locking slide and the upper shell **18**. Thereafter, the upper shell **18** is disposed on the lower shell **16** and the housing **2** is secured together by threaded engagement of the bolts **12** and is placed in a finished condition.

[**0062**] The forces of the springs **59** and **56** are selected relative to one another such that the locking slide **13** is moved via biasing action of the spring associated therewith into the inner space **21** and thereat presses the spread component **32** outwardly, in a manner which overcomes the pressure of the spring **56**, until the spread component **32** lies on the housing floor. The dimensioning of the components is such that the locking slides **13** do not extend out of the through openings **12** and **30** once the spread component **32** is moved into its deepest possible position in which the stop element **8** is disposed downwardly to the widest possible extent out of the housing **2**. This condition of the connector group is shown in **FIG. 8**, in which the locking slides **13** are disposed in the maximum inward position on the inclined surfaces **38** and do not extend outwardly of the housing **2**. As is visible in **FIG. 8, a** magnet **60** is disposed on the lower rear surface of the stop element **8**. All moving components are securely movably guided by corresponding guide surfaces of the housing **2**.

[**0063**] The function of the connector group is described hereinafter:

[**0064**] The hammerhead **6** is turned with assistance of the hand grip **10** out of its locking position shown in **FIG. 8** through 90 degrees into a release position. The hammerhead can then be introduced into a longitudinal hole **66** in the underside of a corner fitting **64** into the interior of the corner fitting **64** until the flange **4** comes into engagement with the underside of the corner fitting **64**. In this manner, the end region **3** of the housing **2** extends into the longitudinal hole and secures the housing **2** against turning. Thereafter, the hand grip **10** is released so that the hammerhead **6** is turned via the biasing action of the spring **24** into its locking position as shown in **FIG. 8**, in which the hammerhead under grips the longitudinal hole **66** and the connector group locks the corner fitting **64** or, respectively, the corresponding container.

[**0065**] If this container or, respectively, this corner fitting **64**, is now lowered via, for example, a crane, towards a lower container or, respectively, an upper corner fitting **68** of such a container, the housing **2** can move into this corner fitting **68** through a longitudinal hole **70** thereof. In the course of this movement or, respectively, this lowering of the upper container, the stop element **8** comes into a position on the floor **72** of the corner fitting **68**. During a further lowering of the housing **2**, the stop element **8** is pushed into the housing **2** and, thereby, the spread component **32** is pushed relative to the housing toward the top thereof, whereby the band **54** is wound up within the housing **52** so that it remains rigid.

[**0066**] The locking slides **13** cannot follow this outward movement, as their top sides are in engagement with the upper edges of the through openings **12** and **30**. The locking slides **32** are, via the positions of the inclined surfaces **38** and **46**, pushed against the force of the spring **59** out of their inner rest position as shown in **FIG. 8** toward the outside to nearby extend through the through openings **12**, **30** outwardly, until they eventually extend into their outer locking positions shown in **FIG. 9**, in which they extend out of the housing **2** and under grip the longitudinal hole **70**. In this position, as shown in **FIG. 9**, the flange **4** lies against the lower corner fitting **68**, so that the upper corner fitting **64** or, respectively, the associated container, are engaged by the flange **4** extending out of the lower corner fitting **68** or, respectively, the associated lower container. **FIG. 10** shows the arrangement shown in **FIG. 9** but rotated about a vertical axis through 90 degrees.

[**0067**] A side displacement between the opposed containers is not possible due to the form-locking engagement of the housing **2** with the respective longitudinal holes **66** and **70**.

[0068] If the containers are disposed one upon the other on a ship, there occurs a securement as well against an oppositely directed release in the vertical direction of the corner fittings and thus, the containers, due to the locking device **50**.

[0069] **FIG. 11** shows, in an exemplary manner, the construction or configuration of the locking device **50**. A spring which is not illustrated is disposed in the housing **52** to bias the shaft **76** in a wind-up direction, the shaft **76** operating to wind the band **54** thereon. The shaft **76** includes, on its side, a disc **76** whose circumferential edge is configured with a tooth structure **80**. A blocking tappet **82** is moveably guided in the housing adjacent the tooth structure, the blocking tappet being linked with a lever **84** which, in turn, is linked with a lever **86** which is mounted in the housing **52**. A inertia mass **88** is disposed at the connection location between the levers **85** and **86** and is suspended from springs **92** and **94**. The capability of the inertia mass **88** to move downwardly is limited by a stop **96**.

[0070] The function of the described arrangement is as follows:

[0071] The shaft **76** is biased to rotate in the clockwise direction so that the band **54** is constantly maintained in tension. Normally, the shaft **76** is rotateable so that an enlargement of the distance between the spread component **32** and the housing **52** is possible in that the shaft **76** rotates in the clockwise direction. If a reduced gravity force acts on the arrangement, such as is the case, for example, if a ship dips into a wave trough, the inertia mass **88** moves under the influence of the springs **92** and **94** outwardly from its equilibrium position, whereby the angle between the levers **84** and **86** increases and the blocking tappet **82** is moved toward the left so that it extends into the tooth structure **80** and blocks rotation of the shaft in the direction towards which an extension of the band **54** would occur. During the application of normal or, even, larger gravity forces, the shaft **76** is again freely rotatable.

[0072] The locking device **50**, as installed in the connector group, functions as follows:

[0073] It is assumed, with reference to the position shown in **FIG. 8**, that the upper corner fitting **64** or, respectively, the upper container, seeks to move away from the lower corner fitting **68** when, for example, the ship dips into a wave trough. The inertia mass **88** then is under the influence of a reduced gravity force so that an extension of the band **54** is blocked. If the connector group is, as a result of the play between the locking slides **13** and the inner upper side of the corner fitting **68**, raised upwardly, the band **54** overcomes the retention force between the magnet **60** and the floor **72** of the corner fitting to thereby raise the spread component **62** upwardly, so that the locking slides **13** remain in the illustrated position and a release of the connector group out of the lower corner fitting **68** is blocked. The container is thus, as well, reliably interconnected to the other container in the event of strong ship movement.

[0074] If the upper corner fitting **64** or, respectively, the associated container, are, in contrast, lifted upwardly by, for example, a crane, then no reduced gravity force acts on the inertia mass **88**, whereby the band **54** is free to be wound out from the shaft and, upon raising of the connector group, the stop component **42** remains in engagement with the floor **72** via the magnetic retention force of the magnet **60**, so that the spread component **32** remains, relative to the housing **2**, displaced downwardly, whereby the locking slide **54**, under the influence of the spring **59**, is pushed inwardly and assumes the position shown in **FIG. 7**, in which it releases the connector group for removal from the corner fitting **68**. The stop element **8** releases itself from the floor **72**, once the spread component **32** engages the lower end of the housing **2**. The magnet **60** ensures that the stop element **8** initially remains engaged to the floor **72** of the corner fitting **68** during raising of the housing **2**, whereby this ensures that the spread component **32** moves outwardly relative to the housing **2** and the locking slides **13** return to their inner release positions.

[0075] It is to be understood that the dimensioning of the individual components and the inclined surfaces **38** and **46** for spreading apart the locking slides **44** are selected relative to one another such that the distance a between the upper side of the locking slide **13** and the corner fitting **68** (**FIG. 9**) is the smallest possible value. This distance a is dictated by the fact that, during insertion of the connector group, the locking slides **13** first can move out of the housing to under grip positions in a longitudinal hole **70**, when the locking slides are in the interior of the corner fitting **68**, and the stop element **8** moves upwardly due to its engagement on the floor **72** of the corner fitting **68** during further downward movement of the housing **2**, whereby, thereafter, the locking slides move outwardly.

[0076] **FIGS. 12 and 13** show an embodiment of the connector group in its release position and lock position, whereby, solely for the purpose of explaining the difference between the heretofore illustrated embodiment, the figures are provided with reference numerals. The locking slides **13** are provided on their upper sides with an inclined surface **68** which is enlarged relative to the inclined surfaces of the heretofore illustrated embodiment. Correspondingly, the through openings **12** and **13** do not need to be configured such that they constantly guide the locking slides along their upper and lower sides. A constant non-obstructed guiding of the locking slides **13** is thus ensured so that the under side of the locking slide is guided along the under side of the through openings and the over sides on the elements **40** are guided along corresponding guides (not illustrated) of the housing **2**.

[0077] The functioning of this embodiment is as follows:

[0078] During the introduction of the housing **2** into the lower corner fitting **68**, the locking slide **13** is disposed completely within the housing **2**, whereby the inclined surfaces **68** are at a distance from the upper edge of the respective through opening **12** or, respectively, **30**. Once the stop element **8** comes into engagement with the floor **72** of the corner fitting **68** (somewhat the position shown in **FIG. 12**), the spread component **62** is raised and, upon further lowering of the housing **2** into the lower corner fitting, moves the locking slides **13** outwardly until, in the fully lowered position of the housing **2** (engagement of the flange **4** on the lower corner fitting **68**), these locking slides have been moved so far outwardly that the original distance between the upper edge of the through openings **12**, **13** has been substantially fully consumed. As can be seen in **FIG. 13**, there exists, between the inclined surfaces **68** and the edge of the longitudinal hole **70**, in comparison to the

heretofore described embodiment, only a very small play, whereby the upper corner fitting **64** (the lower corner fitting of the upper container) is raised only a small amount from the lower corner fitting **68** (the upper corner fitting of the lower container). This reduced play is very advantageous during difficult sea travel, as the container is secured, as well, in substantially play-free manner in the vertical direction.

[**0079**] **FIGS. 14 and 15** show a further embodiment of the connector group of the type shown in **FIGS. 12 and 13**. In this embodiment, the locking slides **13** comprise, on their upper sides and lower sides, inclined surfaces **100**, **102**, which are parallel to one another and for which corresponding through openings **13**, **30** are configured. The inclined surfaces **100**, **102** are oriented outwardly and are upwardly inclined. With the configuration of the inclined surfaces **100**, **102** and the corresponding configuration of the through openings **13**, **30** and the spread component **32** or, respectively, its inclined surfaces, the following is achieved: once the connector group with the housing **2** has been lowered to a sufficient extent into the corner fitting **68** such that the stop element **8** comes into engagement with the floor **72** (**FIG. 14**), the locking slides **13** are moved, upon further lowering movement of the housing **2**, at an inclination outwardly and upwardly so that, in the fully lowered condition of the housing **2**, the locking slides extend into the position shown in **FIG. 15**. In this manner, during an upward movement of the locking slides **13**, at least a portion of the outward movement of the housing **2** is compensated for, so that the distance between the upper side of the locking slide **13** and the upper wall of the corner fitting **68** is reduced relative to that of the first-described embodiment of the connector group. It is to be understood that a relatively slight distance is advantageously maintained so that the locking slides **13**, upon raising of the housing **2**, can be moved via the return force of the spring **59** into the housing **2**. The guiding or, respectively, inclined, surfaces of the spread component **32** and the locking slides **13**, by means of which the locking slides move outwardly at an inclination toward the top during a lowering movement of the spread component or, respectively, move inwardly at an inclination towards the bottom, are shown in broken lines in **FIG. 14** and are otherwise not detailed in **FIGS. 14 and 15**.

[**0080**] **FIGS. 16 and 17** illustrate a further embodiment of the connector group in its release position and its lock position. In connection with this embodiment, the locking slides **13** comprise, on their upper sides, recesses **103**. Further, on the outer end regions of the inclined surfaces **38** of the spread component **32** and/or on the regions cooperating therewith of the locking slides **13**, raised cams **104** are provided. This embodiment provides the following: near the end of the outward movement of the locking slides **13**, these locking slides are slightly raised due to the raised cams **104**. This raising of the locking slides is possible because of the recesses **103** which permit the movement of the locking slides **13** relative to their through openings **12**, **30**. Also, in connection with this embodiment, the distance which exists between the upper side of the locking slides **13** and the inner side of the corner fitting **68** is correspondingly reduced, in that the locking slides are raised during at least a portion of their movement stroke.

[**0081**] Since the housing **2**, the locking slides **13**, and the hammerhead **6** can be highly mechanically loaded, these are preferably comprised out of wrought steel or high value cast metal. The spread component **32** also is advantageously comprised of this material. It is to be understood that the interior of the housing **52** of the locking device **50** is carefully protected against the entry of water or dirt.

[**0082**] The invention can be modified in multiple ways. For example, the locking device **50** can additionally comprise a mechanism which blocks the capability of the shaft to rotate in the unwinding direction of the band **54** upon exceeding a pre-determined speed, so that a rapid or hurried lifting of the hammerhead **6** towards the top is blocked which would otherwise effect the release of the connector group from the lower corner fitting **68**. Such rotational blocking means are conventionally known and are not further described herein. A single locking slide can be provided or more than two locking slides can be provided. The rotation mechanism for the hammerhead can be omitted in that the connector group is disposed directly with the hammerhead into the corner fitting and can be then turned such that the head of the hammerhead under grips the longitudinal hole. The hammerhead can be integrally formed with the housing as an integrally formed single piece. The housing flange can be omitted such that the lower corner fitting of a container can lie directly on the upper corner fitting of another respective container disposed thereunder. There is extensive freedom of design with respect to the constructive configuration of the individual components so long as the core idea of the invention is implemented—namely, that the connector group is removable out of the corner fitting **68** during raising of the hammerhead **6** only under pre-determined conditions and, upon the occurrence of other conditions, blocks this removal.

[**0083**] **FIG. 18** is a perspective view of a modified embodiment of a locking device **110** in its condition on the spread component **32** (see, for example, **FIG. 6**).

[**0084**] The locking device **110** comprises a locking housing **115** formed of 2 housing halves **112** and **114**. The housing halves **112** and **114** are configured in mirror-image symmetry relative to one another and can be threadingly interconnected to one another by means of bolts (not shown) extending through holes **116**. A tappet **118** is received in the locking housing **115**, the tappet extending with a shaft **120** out of the locking housing **115** and being threadably engaged with the shank **34** of the spread component **32**.

[**0085**] The shaft **120** (**FIG. 19**) comprises a head **122** having four arms **124** disposed at an offset to each other around the circumferential direction of the tappet **120** at 90 degree offsets from one another. Each arm is configured with a slot **126** extending transversely therethrough, whereby the slot extends outwardly from a central region **128** of the shaft **120** and extends at an incline outwardly so that, in total, a concave floor surface **130** and a corresponding convex cover surface **132** are formed. The inclination angle of the slot **126** forms an angle of, for example, approximately 4 degrees with the horizontal.

[**0086**] The height of the slots **196** and the width of the arms **124** are selected such that a ball **134** travels in a slot with play, as the ball passes sideways over the slot or, respectively, the arm.

[**0087**] The housing halves **112** and **114** are configured with recesses such that a hollow space **136** for receipt of the

tappet **118** is formed in the locking housing **115**, the hollow space having, in horizontal section (**FIG. 23**) somewhat the configuration of the head **122** of the tappet **118** and having, in vertical section (**FIG. 22**), a configuration corresponding to that of the side of the tappet **118**, whereby the vertical dimension of the hollow space **136** is greater than that of the arm **124**. The walls of the hollow space **136** are provided with grooves **138** such that the slots **126** of the tappet **118** extend through the grooves in a pre-determined installation position of the tappet **118** within the housing **112**, **114** to an extent such that, in the assembled-together condition of the housing with the tappet received therein, the ball **134** extends sidewise into the groove **138** such that a vertical relative movement between the tappet and the housing is blocked. This blocking can only then be lifted once the ball **134** is disposed in the middle of the tappet **122**—that is, on the base of the concave floor surface **130**. In this condition, the ball **134** held in the tappet **122** can move vertically relative to the locking housing **115**, in that it travels along a longitudinal downwardly extending recess **140** at which the groove **138** terminates at its cross section.

[**0088**] The function of the locking device **110** corresponds basically to that of the already-described function of the locking device **50**. The locking housing **115** is, as is the housing **52** of the locking device **50**, rigidly maintained to the housing **2** by the connector group at least in the vertical direction. The tappet **118** is threadably engaged with the shank **34** of the spread component **32** by, for example, threaded engagement of its end region. The region in which the shaft **120** extends into the locking housing **115**, is sealed off via a bellows **142** (**FIG. 20**) which encloses the shaft **120** and a flange **144** of the locking housing **115**.

[**0089**] During vertical orientation of the tappet **122**, the ball **134** is disposed in the central region **134**, so that a vertical relative movement between the tappet **122** and the locking housing **115** is possible. The position of the groove **138** is such that the groove **138** coincides with the middle of the slot **126**, once the condition shown in **FIG. 9** is reached—that is, the condition in which the two corner fittings **64** and **68** which are to be interconnected are rigidly interconnected with one another via the connector group and—via the flange **4**—are stacked on one another. If the vertical position as shown in **FIG. 9** is maintained, then, in connection with a lifting of the upper corner fitting **64**, the locking housing **115** moves, together with the housing **2**, the entire connector group along with the lifting movement, whereby the tappet **118** and the locking housing **115** are released to move relatively to one another so that the spread component **32**, which is retained by the stop element **8**, moves relative to the housing **2** downwardly and thereby releases the locking slides **13** for inward movement so that the connector group can move outwardly of the lower corner fitting **68**.

[**0090**] If the arrangement is tipped about a horizontal axis out of the position shown in **FIG. 9**, the ball **134** moves according to the respective tipping axis in a respective one of the slot **126** and the groove **138** respectively associated therewith, whereby this movement is facilitated by the correspondingly rounded-off transition region **134** (**FIG. 23**). As soon as the ball **134** is disposed in a slot **126**, the capability for relative movement between the tappet **118** and the locking housing **115** is locked out, so that, upon a lifting of the upper corner fitting **64**, the stop element **8** is released from engagement with the floor **72** of the lower corner fitting **68** and the locking slides **13** are not released to move, whereby the corner fittings **64** and **68** remain interconnected.

[**0091**] The described embodiment of the locking device **110** can be modified in many ways. For example, the tappet **118** can be configured with three arms or with a different number of arms. The relative movement which occurs further between the tappet **118** and, thereby, the lock housing **115**, need not necessarily be made possible by a recess **140** in the locking housing **115**. Instead of the recess **140**, the head **122** of the tappet **118** can be configured with a central projection **146** in its central region (**FIG. 24**), in which the cut-out section of the slot **126** continues upwardly, so that a vertical, longitudinal hole-type slot **148** is configured in which a ball **134** retained in the groove **138** can dip into upon an upward movement of the locking housing **115** and, in this manner, release the tappet and locking housing for relative movement therebetween.

[**0092**] A further embodiment of the inventive connector group is described with reference to FIGS. **25-32**. To the extent that already used reference numerals have been used, these are used for the components or, respectively, the component groups, which are identical in their function or similar in their function with the component groups already described or, respectively, the components, so that this structure is not again described.

[**0093**] In contrast to the connector group shown in **FIGS. 1 and 2**, no tappet-type stop element **8** projects outwardly from the underside of the likewise two-shell configured housing **2** of the instant embodiment. The stop element of the instant embodiment is to a much larger degree configured as a projection lever **150**, which is mounted on a bolt **152** itself secured to the housing in a manner such that the projection lever with a projection surface **154** projects downwardly from the underside of the flange **4**. The projection lever **150** comprises an inclined surface for receipt thereon of a corresponding inclined surface of a slide **156**, which is guided in the housing **2** for displacement movement relative thereto. A threaded spring **158** is disposed between the housing **2** and the slide **156** which displaces the slide to the left as viewed in **FIG. 27**.

[**0094**] The slide, which has an overall Z-shaped configuration when viewed from the side, is shown in a perspective view in **FIG. 29** and comprises two side arms **159** having holes **160** in which take along pins **162** extending from below are secured.

[**0095**] The shank of the slide **156** turned away from the projection lever **150** comprises a projection surface **164** which is configured with a recess **166** whose function is described in more detail hereinafter.

[**0096**] A locking component **170** is swingably and displaceably mounted in the housing **2** by means of a bolt **168**, which is secured to the housing, in that the bolt **168** extends through the longitudinal hole **172** (**FIG. 28**) of the locking component **170**. The height of the locking component **170** is selected in correspondence with the height of the corresponding openings **174** in the opposed sides of the housing **2** (**FIG. 25**).

[**0097**] A locking device is received in a recess of the housing **2** and is rigidly connected with a locking housing **180**, which is described with reference to **FIGS. 31 and 32** as follows:

[0098] The locking housing **180** comprises an upper component **184** and a lower component **186** in which a tappet **188** is displaceably guided. The tappet **188** includes a shaft **190** and a head **192**. The upper side of the head **192** is configured with a concave surface having a center toward which a ball **196**, which is configured as a mass body, moves under its own power in the vertical position of the tappet **188**.

[0099] The inner side **198** of the upper component **184** turned toward the tappet is correspondingly configured in correspondence with the concave surface **194** with a convex surface and comprises a recess **200**. A spring **202** is disposed between the tappet **188** and the upper component **184**.

[0100] In the assembled together condition of the locking device **182**, in which the upper component **184** and the lower component **186** are rigidly connected to one another by, for example, threaded engagement, adhesion, or other securement means, and in which the shaft **190** extends downwardly from the housing **180**, the distance between the concave surface **194** and the inner side **198** corresponds approximately to the diameter of the ball **196** so that the ball can move into the intermediate space between the concave surface **194** and the inner side **198** if the locking device **182** undergoes a sidewise acceleration or the locking device is tipped out of a vertical position. In this manner, a movement of the tappet **188** upwardly is locked out. If the ball **196**, in contrast, is disposed in the center or, respectively, the middle, of the concave surface **194**, the tappet **188** can be pressed upwardly against the force of the spring **202**, whereby the ball **196** moves into the recess **200**.

[0101] The illustrated locking device can be deployed for various applications so that protection for the locking device is called for.

[0102] The assembly of the afore-described connector group is as follows:

[0103] The projection lever **150** is disposed with the aid of the bolt **152** in one of the housing shells. The locking device is disposed in the corresponding recess of one of the housing shells. Likewise, the slide **156** is mounted in coordination with the spring **158**, whereby the take along pin **162** extends into the longitudinal hole **172** of the installed locking component **170**. The housing shells are interconnected to one another by means of the screws **11**. The bolts **168** are guided from below upwardly through corresponding openings to position the locking component **170** in the housing, whereby the bolts are extended through the longitudinal holes of the already installed locking component **170**.

[0104] In the release condition, the slide **156** is pushed to the left, as viewed in **FIG. 27**, by the spring **158** to an extent such that the projection lever **150** is tipped or tilted in the clockwise direction and comes into engagement with a projection of the housing. The locking component **170** is then in a position, as can be understood from **FIG. 30**, in which it is in an inwardly swung position with reference to **FIG. 30**, with its outer surface extending in contour-following flush manner along the contour of the housing **2**, so that the locking component **170** does not project out of the housing. The bolt **188** is displaced outwardly through the projection surface **164** of the slide **156** so that the ball **196** is disposed in the recess **200**.

[0105] If the housing **2** of the connector group in this condition is guided in a longitudinal hole of a corner fitting (compare **FIGS. 8 and 9**), the projection lever **150** moves into engagement with the upper side of a corner fitting and is swung in a counterclockwise direction, as viewed in **FIG. 27**. In this manner, the slide **156** is moved toward the right, whereby the locking component **170** is swung outwardly of the housing **2** and under grips the edge of the longitudinal hole in a manner similar to that by which the locking slide **13** operates in the previously described embodiments, so that two corner fittings are rigidly interconnected to one another in a manner corresponding to that of the previously described embodiment. Via a displacement of the slide **156** to the right, as viewed in **FIG. 27**, the recess **166** moves out of the illustrated intermediate position further to the right so that the shaft **190** extends fully into the recess, whereby the depth of the recess is selected such that the tappet **188** extends into its deepest position in which the ball **196** can move outwardly out of the center of the concave surface **194** in order to lock out an outward movement of the tappet **188**. Upon a tipping of the locking device **182** out of the vertical position or upon a sidewise acceleration, an outward movement of the tappet **188** is likewise locked out, whereby, due to its engagement in the recess **166**, a displacement of the slide **156** is locked out and the two components to be interconnected by the illustrated connector group remain securely interconnected with one another. If the ball **196**, in contrast, is disposed in the center of the concave surface **194** and the housing **2** is lifted upwardly, the slide **156** can be pushed by means of the force of the spring **158** through a swing movement of the projection lever **150** in the clockwise direction, which is selected such that the movement overcomes the force of the spring **202** of the locking device and pushes the tappet **188** upwardly to the left with assistance of a suitable inclination of the wall of the recess **166**. In this manner, the locking component **170** is swung into the housing so that the housing **2** can be removed from the longitudinal hole.

[0106] It is to be understood that the bolt **168** and the locking component **170**, as well as their respective guides, are dimensioned relative to the openings **174** of the housing **2** such that the locking component can handle a high force thereupon upon the application of a pulling force on the hammer head.

[0107] The illustrated embodiments can be modified in numerous ways. For example, the hammer head **6** can be replaced by a securement piece by which the housing **2** can be directly secured to, for example, a chassis or a frame. Moreover, the entire arrangement can be turned such that the components to be interconnected to one another via the connector group such as, for example, fittings, are fastened or secured to one another in a sidewise manner, whereby the locking device such as, for example, the locking device **182**, is arranged such that it assumes a release position in a vertical orientation as well as in a position free of the application of a sidewise force.

[0108] There are several possibilities for turning of the hammer head **6** out of its release position, in which the connector group can be disposed in an upper container or into a lock position, in which the connector group can be retained in the upper container. The turning of the hammer head can be manually effected by hand, in that, for example, the locking position is the normal position and the hammer head **14** can be pulled via the hand grip **10** against the spring force into a release position. The movement of the hammer

head **14** into its locking position can also be automatically effected, in that, for example, an additional lever or button is arranged on the upper side of the flange **4**, which is moved by a container disposed thereonto from above, whereby, via the movement of the lever or button, the hammer head **14** is moved from its locking position into its release position. The movement out of the locking position into the release position can alternatively be effected by the assistance of the hand grip **10**. In a still further modified embodiment, the locking of the hammer head **14** can follow in common with the movement of the locking component, in that, for example, the take along pins **162** of the slide are extended upwardly and extend into the hollow space **20**, where they engages the flange **22** of the hammer head **6** (**FIG. 3**) in a manner such that the hammer head **6** is turned in coordination with a displacement of the slide.

[**0109**] In a further modified embodiment, the flange **4** of the housing can be elongated and two adjacently arranged housings of the connector groups can be rigidly interconnected with one another so that, via the introduction of the housing into such a double connector group arrangement in adjacently disposed containers, the adjacent containers are also rigidly interconnected with one another.

[**0110**] A further embodiment of an inventive connector group is described with reference to FIGS. **33-38**, which has the same basic configuration as that of the embodiment shown in **FIG. 27**. The same reference numerals are used for the same function identical components.

[**0111**] The housing **2** of the connector group is not, in the illustrated example, provided with a completely fully extending flange, as is the case with the previously described housings, but is, instead, provided with a flange **4** having only a side projection, in which the projection lever **150** is disposed in a manner such that it projects over the flange **4**. An inclined surface of the slide **156**, which cooperates with the projection lever **150**, is, as seen in **FIG. 33**, configured upwardly to the left of the slide. The slide **156** applies force via a tappet **210**, which engages in a recess of the slide **156** and in recess eccentrically disposed on the flange **22** of the hammer head **6**, the slide **156** working in coordination with the hammer head **6** so that the hammer head **6**, in coordination with a displacement of the slide, is turned. The hammer head **6** corresponds in its function as well as the locking component **170** to the embodiment shown in **FIG. 27**.

[**0112**] Side projecting noses **212** are disposed in the lower region of the housing **2** and are engaged in recesses **214** which are configured on the inner sides of the previously described fittings **218** corresponding with corner fittings. A spring **220** disposed interiorly in the interior space **219** of the corner connector fitting **218** engages the underside of the housing **2**, the spring **220** being supported against the floor **224** of the connector fitting **218**, the floor **224** having drain openings **222**, and pushes the housing **2** of the connector group outwardly as viewed in the figures of the drawings, whereby a projection of the noses **212** on the upper end of the recesses **214** limits the upward movement of the housing **2**.

[**0113**] The function of the connector group is such that, upon the disposition of, for example, a lower corner fitting of a container onto the upper side of the corner connector fitting **218**, the projection lever **150** is turned in the clockwise direction and thereby displaces the slide **156** so that the hammer head **6** is turned into the locking position as shown in **FIG. 34** in which it under grips a not-illustrated upper corner fitting having a longitudinal hole, as has been described with the previously described embodiments.

[**0114**] As seen in **FIG. 35**, the noses **212**, which maintain the housing **2** in a non-removable disposition on the fittings **218**, are configured on all four sides of the housing **2**.

[**0115**] The function of the spring **220** is to make possible the movement of the housing **2** in its entirety into the connector fitting **218**, if the hammer head **6**, as shown by the arrow in **FIG. 36**, or the upper side of the housing **2** extending over the hammer head, is subjected to a force from above. The spring **220** is in this regard is designed to be stronger than the spring **158** such that the housing **2**, during a swinging movement of the projection lever **150**, in which frictional force and the force of the spring **158** must be overcome, is not moved into the connector fitting **218**.

[**0116**] **FIG. 37** shows a connector group **225** of the illustrated type in perspective view. **FIG. 38** shows the connector group **225** deployed in the connector fitting **218**. The connector fitting **218** is assembled together from two components **226, 228** which are, after the deployment of the connector group **225**, rigidly interconnected to one another.

[**0117**] The advantages of the illustrated connector group **225** are achieved, for example, as follows, with reference being had to **FIG. 39**:

[**0118**] Connector fittings **218** are secured at predetermined locations by, for example, welding on the longitudinal carrier **230** which is, for example, a railroad wagon or another conventional transport platform. Connector groups **225** are deployed in the fittings **218**. In the illustrated example, a forty foot container **232** is disposed on the longitudinal carrier, the corner fittings of the container, as have been described hereinabove, being reliably interconnected with the corners of the fittings **218** disposed thereunder. The fittings **218** in the middle of the configuration shown in **FIG. 39** are configured such that they do not correspond to any corner fitting of the forty foot containers but, instead, correspond to the corner fittings of twenty foot containers, which can be transported in lieu of the forty foot containers **232**. In connection with the transport of forty foot containers, the connector groups **225** deployed in the middle fittings **218** extend into the fittings, as shown in **FIG. 36**, so that no manual manipulation of the forty foot containers or twenty foot containers during loading and removal as well as during transport movement can occur.

[**0119**] The illustrated connector group **225** can be modified in numerous ways. For example, the noses **212** can be displaced in a single direction against the spring force, so that, in the configuration of the connector fitting **218** with suitable holes, the noses are displaced into the housing **2** and can be removed from the connector fitting **218**. Furthermore, the noses can be configured such that they can be moved with the assistance of a tool in a manner similar to that of a lock in the housing. The fitting can be configured as a single piece.

[**0120**] **FIG. 40** shows the deployment of the inventive connector groups on a railroad wagon whose loading platform is provided with joints **234** on which the connector groups **225** are secured, in a manner similar to those

illustrated in connection with **FIG. 37**. The housing of each connector group can be deployed in a corresponding hole formed in the respective lid, whereby the noses **212** are elastically resiliently biased to move in a return direction and the housing is aligned with the lids (the housing of the connector group is then provided with a corresponding flange). In coordination with a lid **234** in its raised position, the connector group **225** is in its operational ready position for automatic locking and release with a container. In the swung-out position of the lid **234**, the connector group does not stand in the way of a correspondingly configured hole of the container. Via the lids **234**, which can, alternatively, be welded with the housing of the connector group, it is achieved that the arrangement of the connector group, which is displaceable against the spring force, as illustrated, for example, in **FIG. 36**, is no longer required.

[**0121**] There are numerous modifications of the illustrated embodiment of the connector groups. Individual features of the illustrated embodiments can be combined with one another in various ways. The entire connector group can, for example, by turning through 90 degrees and corresponding other orientations of the locking device, also be used for an interconnection of components which are arranged in side by side manner to one another. The openings, through which the connector groups are deployable, need not necessarily be longitudinal holes; they can, however, be any suitable non-annular holes or even annular holes which can be under gripped.

[**0122**] **FIG. 41** shows a schematic view of a variation of, for example, the connector group shown in FIGS. **33** - **38**, taken along a transverse sectional view of, for example, a railroad wagon. The upper end region **3** of the housing **2** which extends in its entirety to the longitudinal hole **66** of the corner fitting **64**, is configured in its middle region with a reduced mass relative to the longitudinal hole **66** and expands outwardly toward its upper end, so that only an upper edge **236** is substantially uniformly dimensioned as is the longitudinal hole **66**. In this manner, it is achieved, during a transverse movement of the corner fitting **64** in the direction of the horizontal double arrow such as, for example, upon passage through curves, that the edge of the longitudinal hole **66** moves into engagement with an upwardly enlarging inclined surface **238** of the end region **3**, which works against a tipping of the corner fitting **64** or, respectively, the associated container, in the direction of the arcuate-segement shaped double arrow.

[**0123**] **FIG. 42** shows an example of a connector group corresponding, for example, to that of **FIG. 15**, with an upper view of an upper corner fitting of a container in which the hammer head extends. The housing **2** of this connector group is disposed underneath the flange **4** for use, for example, on a ship, on which the not-illustrated corner fitting of an upper container is disposed, with reduced cross section. If, for example, a storm blows from the left hand side as viewed in **FIG. 42**, the upper container and the connector group associated therewith are displaced toward the right, so that the under edge of the upper side of the lower container having a lower corner fitting **68** comes into engagement with the inclined surface **238**. As a result of this engagement, the housing **2** of the connector group, which is locked with limited play in the lower corner fitting **68**, cannot move upwardly relative to the lower corner fitting, which reinforces the stability of the interconnected containers.

Reference Numeral List

[**0124**] **2** housing

[**0125**] **3** end region

[**0126**] **4** flange

[**0127**] **6** hammer head

[**0128**] **8** projection or stop element

[**0129**] **10** hand grip

[**0130**] **11** screw

[**0131**] **12** through opening

[**0132**] **13** locking slide

[**0133**] **14** head

[**0134**] **16** lower shell

[**0135**] **18** uppershell

[**0136**] **20** hollow space

[**0137**] **21** innerspace

[**0138**] **22** flange

[**0139**] **24** rotation spring

[**0140**] **26** through channel

[**0141**] **30** through opening

[**0142**] **31** hole

[**0143**] **32** spread component

[**0144**] **34** shank

[**0145**] **36** spread component or piece

[**0146**] **38** inclined surface

[**0147**] **40** projection

[**0148**] **46** inclined surface

[**0149**] **48** guide projection

[**0150**] **50** locking device

[**0151**] **52** housing

[**0152**] **54** band

[**0153**] **56** spring

[**0154**] **58** securement location

[**0155**] **59** spring

[**0156**] **60** magnet

[**0157**] **64** corner fitting

[**0158**] **66** longitudinal hole

[**0159**] **68** corner fitting

[**0160**] **70** longitudinal hole

[**0161**] **72** floor

[**0162**] **74** guides

[0163] **76** shaft

[0164] **78** disk

[0165] **80** tooth structure

[0166] **82** locking tappet

[0167] **84** lever

[0168] **88** inertia mass

[0169] **92** spring

[0170] **94** spring

[0171] **96** projection

[0172] **98** inclined surface

[0173] **100** inclined surface

[0174] **102** inclined surface

[0175] **103** recess

[0176] **103** raised cams

[0177] **110** locking device

[0178] **112** housing half

[0179] **114** housing half

[0180] **115** locking housing

[0181] **116** hole

[0182] **118** tappet

[0183] **120** shaft

[0184] **122** head

[0185] **124** arm

[0186] **126** slot

[0187] **128** central region

[0188] **130** floor surface

[0189] **132** cover surface

[0190] **134** ball

[0191] **136** hollow space

[0192] **138** groove

[0193] **140** recess

[0194] **142** bellows

[0195] **144** transition region

[0196] **146** projection

[0197] **148** slot

[0198] **150** projection lever

[0199] **152** bolts

[0200] **154** projection surface

[0201] **156** slide

[0202] **158** spring

[0203] **159** arm

[0204] **160** hole

[0205] **162** take along pin

[0206] **164** support surface

[0207] **166** recess

[0208] **168** bolts

[0209] **170** locking components

[0210] **172** longitudinal hole

[0211] **174** openings

[0212] **180** locking housing

[0213] **182** locking device

[0214] **184** upper piece

[0215] **186** lower piece

[0216] **188** tappet

[0217] **190** shaft

[0218] **192** head

[0219] **194** concave surface

[0220] **196** ball

[0221] **198** inner side

[0222] **200** recess

[0223] **202** spring

[0224] **210** tappet

[0225] **212** nose

[0226] **214** recess

[0227] **218** fitting

[0228] **219** innerspace

[0229] **220** spring

[0230] **222** drain opening

[0231] **226** piece

[0232] **228** piece

[0233] **230** longitudinal carrier

[0234] **232** container

[0235] **234** lid

[0236] **236** edge

[0237] **238** inclined surface

1. A self-locking and self-releasing connector group for connecting two components, at least one of which comprises an undercut hole for partial insertion or introduction of the connector group and which is preferably a corner fitting of a sea freight container, comprising

a housing (**2**),

at least one locking component (**13**, **170**, **6**) movably mounted in the housing (**2**), which is movable between a release position and a locking position,

a stop element (**8**, **150**) movably mounted on the housing, whereby a component (**64**, **218**) is mounted on the housing and, in the release position of the locking component during movement of two components (**64**, **68**, **218**, **232**) to be interconnected to one another, is insertable through the hole of the other component (**86**,

232), the stop element during further movement of the components to be interconnected toward one another moving relative to the housing and thereby moving the locking component out of its release position into its locking position in which it undergrips the longitudinal hole, so that the components to be interconnected are interconnected to one another, and

a locking device (**50**, **110**, **182**) which locks out a movement of the components interconnected to one another out of their locked together position into a release position in connection with a movement of the locking components (**13**, **170**, **6**) in which they are accelerated outwardly beyond a predetermined degree and/or are moved out of a rest position.

2. A connector group according to claim 1, whereby the locking device (**182**) comprises two movable components (**188**, **180**) movable relative to one another and an inertia mass (**196**), which blocks the capability of the components to move relative to one another, in the event that the locking device is subjected to a horizontal sliding component and/or the locking device is tipped about a horizontal axis out of a normal position.

3. A connector group according to claim 2, whereby the locking device (**182**) comprises a locking housing (**180**) in which a head (**192**) of a tappet (**188**), which is displaceably guided in the locking house, is received, the head having an upper side (**194**) configured such that a ball (**196**), which acts as an inertia mass, is disposed in a deepest point in the center of the over side during vertically upright orientation of the locking device in which the locking device is not subject to any sidewise force and the ball (**196**) moves out of its deepest position in correspondence with a tipping of the locking device and/or a sidewise acceleration, and a counter surface (**198**) in the housing disposed in opposition to the outer side (**194**) of the head and being configured such that it cooperates with the ball (**196**) to effect a locking out of movement in the event of a movement of the head in the direction toward the counter surface.

4. A connector group according to claim 1, whereby the locking device (**50**) comprises a rotatable shaft (**76**) onto which a band (**54**) is wound up, the band (**54**) cooperating with the stop element and comprising a locking mechanism (**80**, **82**) which locks out the capability of the shaft (**76**) to rotate during the occurrence of predetermined operational conditions.

5. A connector group according to one of claims **1-4**, whereby the stop element (**8**, **50**), moves, during movement of the components (**64**, **68**) to be interconnected to one another toward one another, the locking component (**13**, **170**) out of an interconnecting position into a locking position extending sidewise out of the housing.

6. A connector group according to one of claims **1-6**, whereby the housing (**2**) comprises a hammerhead (**6**) disposed on a rear side thereof in a rotatably mounted disposition, the hammerhead being displaceable into a corresponding longitudinal hole (**66**) in one of the components (**64**) to be interconnected to one another, whereby a turning of the hammerhead acts to secure the housing thereto, and the hammerhead being turnable to assume an undergrip position in the longitudinal hole.

7. A connector group according to one of claims **1-6**, whereby the stop element (**150**), during movement of the components (**218**, **232**) to be interconnected to one another, turns the locking component (**6**), which is rotatably mounted on the rear side of the housing (**2**), into a locking position.

8. A connector group according to claim 7, whereby the locking component is configured as a hammerhead (**6**).

9. A connector group according to claim 7 or **8**, whereby at least a portion of the housing to be inserted into the hole (**170**) of one of the components (**218**) to be interconnected to one another extends into the hole and undergrips the hole and is displaceable against the force of a spring during further movement into a hollow space (**219**) behind the longitudinal hole.

10. A connector group according to one of claims **1-9**, whereby the housing (**2**) comprises a flange (**4**) for engagement on an outermost rear surface of at least one of the components to be interconnected to one another and the stop element (**150**) is mounted on the housing in a manner such that it is movable out of a position extending over one of the flanges into a position in which it is substantially flush with the flange.

11. A connector group according to one of claims **1-8**, whereby the components (**64**, **68**) to be moved toward one another to thereby interconnect to one another engage a flange (**4**) on one of the housings (**2**) in opposed manner.

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