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(54) **Drivers compartment at lifting trucks**

Fahrerkabine für Hebefahrzeuge

Cabine de conducteur pour chariots élévateur

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(73) Proprietor: **BT Industries Aktiebolag**
595 81 Mjölby (SE)

(72) Inventors:
- **Sten, Jonasson**
  S-595 34 Mjölby (SE)
- **Jacobsson, Carl Olof**
  S-596 00 Skänninge (SE)

(74) Representative: **Berglund, Erik Wilhelm**
Berglunds Patentbyra AB
Aspebraten
590 55 Sturefors (SE)

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Description

[0001] This invention concerns an arrangement at the drivers compartment at lifting trucks including a steering wheel for the controlling of the travel direction and different control means for the controlling of the lifting device of the truck.

[0002] Lifting Trucks are frequently used during long work shifts in an environment that is arduous for the driver through time strain, noise, cold, heat and high demands on accuracy etc. For industrial trucks intended for indoor material handling the complication is added that the driver normally sits in a driving seat directed perpendicularly in relation to the common longitudinal and traveling direction. In order to avoid load and wear injuries of the drivers great efforts have been made to improve the sitting position and the accessibility for different control means. Thus the steering wheel is frequently supported on a console that can be moved from or towards the driver and there are further different supports for arms and elbows. Hitherto known trucks however have stationary control means for the controlling of the lifting device etc while steering wheel and drivers seat normally are adjustable. This means that the localization of the control means must be done according to some chosen normal value while the steering wheel can be adjusted individually for each driver. The control means will therefor be placed too far away for a short driver and too close for a big one. This influences not only the ergonomics but also the driving safety in particular in situations where precision and swiftness is required.

[0003] From EP-A- 0 555 025 (applno. 93300680.1) a truck with pivoting arm rests is known. The operator travels up with the forks and their load gripping two control handles which also serve as support, particularly if the operator is standing up. Even if the armrests are pivotable the position of the operator will be very much the same at all times when manoeuvreing is executed. If the operator did not have considerable much of other activities (picking goods for instance) this would lead to worn muscles and joints. For this particular truck the handles are presumably very good also in a way securing that the operator has the right position when lifting and lowering himself. For other types of trucks that are driven around more like cars or where the driver always remain at the ground level the pivotable armrests with their manoeuvreing handles would instead lock a drivers position too much resulting in worn hands, arms and shoulders and also increased strain on the neck that would have to compensate the fixed body, for instance when looking up at a load.

[0004] One purpose of this invention is therefor to achieve an arrangement at drivers compartments for truck drivers, that is so built that the mentioned inconveniences can be avoided. Another object is to obtain a more efficient and more easily handled unit for the steering and controlling of the truck.

[0005] The above objects are achieved by an arrangement where the steering wheel and the control means are arranged on a common control panel and that this is carried by a movable arm that is adjustable in different positions for adaption to different drivers and that the control panel is an elongate body with an upper side and a lower side and that the steering wheel is mounted on the upper side of one end of the body.

[0006] Further objects and advantages with the invention are apparent from the following description.

[0007] The invention will now be described in greater detail with reference to the appended drawings on which:

Fig. 1 is a perspective view seen obliquely from behind of a previously known lifting truck suited for the provision of an arrangement according to the invention;
Fig 2 a perspective view of a device according to the invention;
Fig 3 a lateral view of a schematically depicted arrangement according to the invention;
Fig 4 is a view from above of the arrangement shown in fig 3.

[0008] Fig 1 shows a so called movable mast truck intended for indoor handling of palleted goods. The truck includes, as is usual, a chassis 11 and a lifting mast 12 mounted on the chassis 11 and in turn carrying a lifting device 13 in the shape of a lifting fork movable in a carriage along the mast. On the rear part of the truck a driving compartment in the shape of a drivers cabin 14 is arranged. This includes two lateral walls 15, 16, a front wall 17 and a protecting roof 18 while the rear side essentially is left free. The driver of the truck will be seated essentially perpendicularly to the longitudinal direction of the truck and consequently the drivers seat 19 is located at one 14 of the lateral walls and turned towards the other 15. Furthermore a steering wheel 20 for the steering of the truck is located at the latter wall while different control means 21 for the controlling of travel direction and lifting means are arranged on the front wall 17 of the cabin. On this there is also an arm support in the shape of a cushion 22.

[0009] This invention concerns as mentioned a further development of drivers compartments of the kind that is apparent from fig 1. In fig 2 the same reference numerals are used for corresponding details and the figure thus shows a cabin interior seen towards one lateral wall 15 of the cabin and the front wall 17. Instead of a traditional steering wheel and fixed controls on an instrument panel this truck has a control panel 25 common to these controls that is supported on a movable supporting arm 26. The control panel 25 is an elongate body with an upper and a lower side 27, 28, the steering wheel 20 being mounted on the upper side 27 at one end 29 of the elongate body. The steering wheel is in miniature with a diameter of about one hundred millimeters and the entire length of the control means is about 500 millimeters. The

steering wheel is in a known manner arranged for electrical control of the driving and steered wheels 23 of the truck why only small easy movements are required for steering the truck. On the upper side of the panel 27 to the left there is further a plate 30 that is slidable laterally in accordance with the double arrow 29. The movement can be achieved with the palm of the hand and controls the travel direction of the truck forwards or backwards. The control means 21 further includes a number of control sticks 31 - 34 intended for different special functions. With the control stick 31 the lifting device 13 is moved vertically along the lift mast 12 and with the control stick 32 the entire mast 12 can be moved forwards along the chassis away from and back to the front cabin wall 17. The control stick 33 is arranged for an inclining of the forks 13, so called tilting, while the control stick 34 can move the forks 13 laterally, so called side shift. The control sticks 31-34 are preferable controlled with the fingertips of the hand, the palm of which lies against the travel direction switch 30 why many of these functions can be executed simultaneously by a trained driver. common for all control means are that they are arranged for electric control which makes them very easy to move and at the same time the positioning becomes very exact.

[0010] The control panel 25 is as mentioned carried on the support arm 26 that in turn is supported on a slide device 35 mounted in the cabin wall 17. The slide device runs along a pair of rails 36 inside the wall and can be displaced according to the arrows 37 in fig 3 from or towards the driver. The support arm is hingedly fastened in slide as well as in control panel and can be pivoted around the pivot axles 38 and 39 as the arrows 40 and 41 also illustrate. The support arm 26 is coupled to a gas spring 42 that in addition to general damping and balancing also is arranged to force the control panel 25 upwards after ended driving and the release by a lock or fixing device. In this way the drivers passing in and out is facilitated. The support arm is preferably further placed close to the truck wall 17 to simplify passing in and out and to reduce the risk of casualties to the drivers legs and knees. To achieve a suitable placing of the steering wheel the control panel 25 protrude from the wall, at least half the panel length. The width of the panel allow a comfortable extending forward of the arms of the driver.

[0011] The described control panel 25 can thus by movements in the different free movement directions according to the arrows 37 40 and 41 be adjusted so that the height and the distance to the drivers seat always is adapted to the present driver and his wishes. Since steering wheel and control means will be situated symmetrically on the same distance from the driver, unnecessary oblique positioning of the body is avoided since the two hands of the driver does not have to work on two different distances. In the shown example one hand of the driver may rest on and around the steering wheel 20 while the other can rest on the travel direction plate 30 or on the panel 30 itself. The same arm and hand that is used for the actuation of the control means can preferably also be supported via an elbow support 43 on the wall, the support cushion 44 of which may be pivotable inward towards the drivers seat around an axle 45. Thereby the support cushion 44 may be directed straight towards the control means 21 and provide a longer and more comfortable support for the forearm.

[0012] It is also possible to have the control sticks mounted on the laterally slidable direction plate 30.

[0013] The direction plate 30 may be substituted for a thumb switch gripping the thumb on both sides for lateral displacement either way.

[0014] Instead of having the support arm carrying the control panel slidable from and towards the driver the arm itself may be adjustable to its length, which provides more room for other devices. In order to provide even more possibilities for adjustment the panel can be tiltable sideways or pivotable in a horizontal plane. The latter in case the driver tends to sit slightly turned. Ultimately the arm may in its ends be movable and fixable in ball joints to enable any desired adjustment of the steering and control panel according to the invention.

Claims

1. Arrangement at the drivers seat or compartment in lifting trucks including a steering wheel (20) for control of the travel direction and different control means (21) for controlling the lifting means (13) of the truck **characterized in** that the steering wheel and the control means are arranged on a common control panel (25) and that this is carried by a movable arm (26) that is adjustable in different positions for adaption to different drivers and that the control panel (25) is an elongate body with an upper side (27) and a lower side (28) and that the steering wheel is mounted on the upper side of one end (29) of the body.

2. Arrangement according claim 1 **characterized in** that the control panel (25) is arranged essentially perpendicular to the sitting direction of the driver.

3. Arrangement according to claim 1 or 2 **characterized in** that the control means (21) includes a number of control sticks (31, 34) intended for manoeuvering by the drivers fingers.

4. Arrangement according to any of the preceding claims **characterized in** that the control means 21 includes a laterally slidable plate (30) intended for manoeuvering by the palm of one of the drivers hands or a thumb.

5. Arrangement according to claim 4 **characterized in** that the plate (30) is arranged on the upper side (27)

of the control panel and is slidable in its lengthwise direction and that the control sticks are arranged in front of the plate so that the driver with one of his hands or the thumb can manoeuver the plate as well as a number of control sticks at the same time.

6. Arrangement according to any of the preceding claims **characterized in** that the support arm (26) has a first end that is carried on a slide device (35) in the body of the truck and an other end fastened in the control panel (25).

7. Arrangement according to any of the preceding claims **characterized in** that the support arm (26) is pivotable relative the slide device (35) and that the control panel (25) is pivotable in the same plane in relation to the support arm.

8. Arrangement according to any of the preceding claims the drivers compartment including a cabin with a seat (19) directed essentially perpendicular to the length direction of the truck and located at a cabin wall (17) towards the mast **characterized in** the slide device (35) being contained in said cabin wall (17) and the support arm being arranged to run along and close to the cabin wall and that the control panel (25) protrudes with at least half of its length essentially perpendicular from the wall.

9. Arrangement according to any of the preceding claims **characterized in** that an elbow support (43) is arranged on the cabin wall which includes a support cushion (44) pivotable around a vertical (45) axle so that one arm of the driver can at the same time rest on the support cushion and the control panel (25).

10. Arrangement according to any of the preceding claims **characterized in** that the width of the panel (length of the panel body) corresponds to the width of the driver.

11. Arrangement according to any of the preceding claims **characterized in** that the support arm for the control panel is telescopic or extendable.

Patentansprüche

1. Bedienungsanordnung am Fahrersitz oder in der Fahrerkabine bei Hubfahrzeugen, welche ein Lenkrad (20) zum Steuern der Bewegungsrichtung und weitere Steuereinrichtungen (21) zum Steuern der Hubeinrichtung (13) des Hubfahrzeugs umfaßt, **dadurch gekenn zeichnet,** daß das Lenkrad und die Steuereinrichtungen auf einer gemeinsamen Steuerkonsole (25) angeordnet sind, daß diese von einem beweglichen Arm (26) getragen wird, welcher auf unterschiedliche Positionen zur Anpassung an die jeweiligen Fahrer einstellbar ist, daß die Steuerkonsole (25) von einem länglichen Körper mit einer oberen Seite (27) und einer unteren Seite (28) gebildet wird, und daß das Lenkrad an der oberen Seite eines Endes (29) des Körpers angebracht ist.

2. Bedienungsanordnung nach Anspruch 1, **dadurch gekennzeichnet**, daß die Steuerkonsole im wesentlichen senkrecht zur Sitzrichtung des Fahrers angeordnet ist.

3. Bedienungsanordnung nach Anspruch 1 oder 2, **dadurch gekennzeichnet,** daß die Steuereinrichtung (21) eine Anzahl von Steuerhebein (31, 34) umfaßt, welche zur Handhabung durch die Finger des Fahrers bestimmt sind.

4. Bedienungsanordnung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet,** daß die Steuereinrichtung (21) eine in Querrichtung gleitbewegliche Platte (30) umfaßt, welche dazu bestimmt ist, durch die Handfläche einer der Hände des Fahrers oder einen Daumen gehandhabt zu werden.

5. Bedienungsanordnung nach Anspruch 4, **dadurch gekennzeichnet,** daß die Platte (30) auf der oberen Seite (27) der Steuerkonsole angeordnet und In Längsrichtung gleitbeweglich ist, und daß die Steuerhebel frontseitig zu der Platte derart angeordnet sind, daß der Fahrer mit der einen Hand oder dem Daumen die Platte sowie eine Anzahl von Steuerhebeln gleichzeitig bedienen kann.

6. Bedienungsanordnung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet,** daß der Tragarm (26) ein erstes Ende hat, welches auf einer Gleiteinrichtung (35) in dem Körper des Hubfahrzeugs gelagert ist, und dessen anderes Ende fest mit der Steuerkonsole (25) verbunden ist.

7. Bedienungsanordnung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet**, daß der Tragarm (26) relativ zu der Gleiteinrichtung (35) schwenkbeweglich ist, und daß die Steuerkonsole (25) in ein und derselben Ebene, bezogen auf den Tragarm, schwenkbeweglich ist.

8. Bedienungsanordnung nach einem der vorangehenden Ansprüche, bei der die Fahrerkabine eine Kabine mit einem Sitz (19) umfaßt, welche Im wesentlichen senkrecht zur Längserstreckung des Hubfahrzeugs verläuft und an einer Kabinenwand (17) in Richtung zu dem Hubmast liegt, **dadurch gekennzeichnet**, daß die Gleiteinrichtung (35) in der Kabinenwand (17) enthalten ist, daß der Tragarm derart ausgelegt ist, daß er längs und in der

Nähe der Kabinenwand eine Bewegung ausführt, und daß die Steuerkonsole (25) wenigstens mit der Hälfte ihrer Länge im wesentlichen senkrecht über die Wand vorsteht.

9. Bedienungsanordnung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet,** daß eine Armauflage (43) an der Kabinenwand angeordnet ist, welche eine Stützauflage (44) umfaßt, welche um eine vertikale Achse (45) schwenkbeweglich ist, so daß ein Arm des Fahrers gleichzeitig auf der Stützauflage und der Steuerkonsole (25) aufliegen kann.

10. Bedienungsanordnung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet,** daß die Breite der Konsole (Länge des Steuerkonsolenkörpers) der Breite des Fahrers entspricht.

11. Bedienungsanordnung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet,** daß der Tragarm für die Steuerkonsole teleskopartig oder ausfahrbar ausgelegt ist.

Revendications

1. Agencement situé au niveau du siège ou du compartiment conducteur dans des chariots élévateurs, comprenant un volant (20) permettant de commander la direction de déplacement et différents moyens de commande (21) pour commander les moyens élévateurs (13) du chariot, caractérisé en ce que le volant et les moyens de commande sont agencés sur un panneau de commande commun (25) et en ce que celui-ci est supporté sur un bras mobile (26) réglable dans différentes positions pour permettre une adaptation à différents conducteurs et en ce que le panneau de commande (25) est un corps allongé avec un côté supérieur (27) et un côté inférieur (28) et en ce que le volant est monté sur le côté supérieur d'une extrémité (29) du corps.

2. Agencement selon la revendication 1, caractérisé en ce que le panneau de commande (25) est agencé essentiellement perpendiculairement à la direction d'assise du conducteur.

3. Agencement selon la revendication 1 ou 2, caractérisé en ce que les moyens de commande (21) comprennent plusieurs leviers de commande (31, 34) destinés à être manoeuvrés par les doigts du conducteur.

4. Agencement selon l'une quelconque des revendications précédentes, caractérisé en ce que les moyens de commande (21) comprennent une plaque latéralement coulissante (30) destinée à être manoeuvrée par la paume d'une main ou un pouce du conducteur.

5. Agencement selon la revendication 4, caractérisé en ce que la plaque (30) est agencée sur le côté supérieur (27) du panneau de commande et est coulissante dans le sens de la longueur de celle-ci et en ce que les leviers de commande sont agencés devant la plaque, de sorte que le conducteur, en utilisant une main ou un pouce, peut manoeuvrer la plaque ainsi que plusieurs leviers de commande en même temps.

6. Agencement selon l'une quelconque des revendications précédentes, caractérisé en ce que le bras de support (26) possède une première extrémité qui est supportée sur un dispositif formant coulisseau (35) dans le corps du chariot et une autre extrémité fixée dans le panneau de commande (25).

7. Agencement selon l'une quelconque des revendications précédentes, caractérisé en ce que le bras de support (26) peut pivoter par rapport au dispositif formant coulisseau (35) et en ce que le panneau de commande (25) peut pivoter dans le même plan par rapport au bras de support.

8. Agencement selon l'une quelconque des revendications précédentes, le compartiment conducteur comprenant une cabine équipée d'un siège (19) dirigé essentiellement perpendiculairement au sens de la longueur du chariot et situé au niveau d'une paroi de cabine (17) en direction de la potence, caractérisé en ce que le dispositif formant coulisseau (35) est contenu dans ladite paroi de cabine (17) et en ce que le bras de support est agencé de manière à s'étendre le long et prés de la paroi de cabine et en ce que le panneau de commande (25) dépasse, au moins la moitié de sa longueur étant essentiellement perpendiculaire à la paroi.

9. Agencement selon l'une quelconque des revendications précédentes, caractérisé en ce qu'un accoudoir (43) est agencé sur la paroi de cabine qui comprend un coussin d'accoudoir (44) pouvant pivoter autour d'un axe vertical (45), de sorte qu'un bras du conducteur puisse à la fois reposer sur le coussin d'accoudoir et sur le panneau de commande (25).

10. Agencement selon l'une quelconque des revendications précédentes, caractérisé en ce que la largeur du panneau (la longueur du corps de panneau) correspond à la largeur du conducteur.

11. Agencement selon l'une quelconque des revendications précédentes, caractérisé en ce que le bras de support du panneau de commande est télesco-

pique ou extensible.

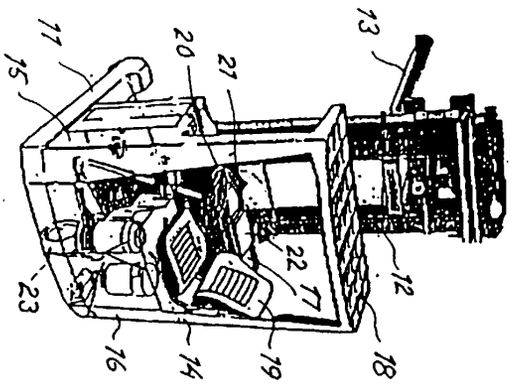
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Fig. 1

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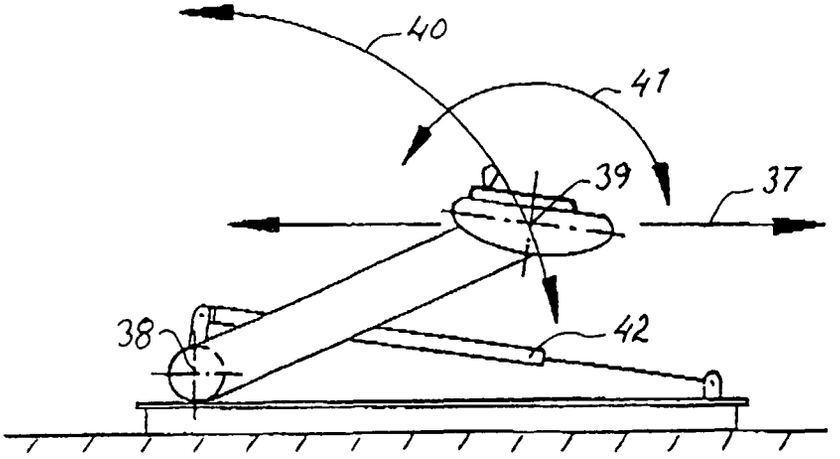
Fig. 2

Fig. 3



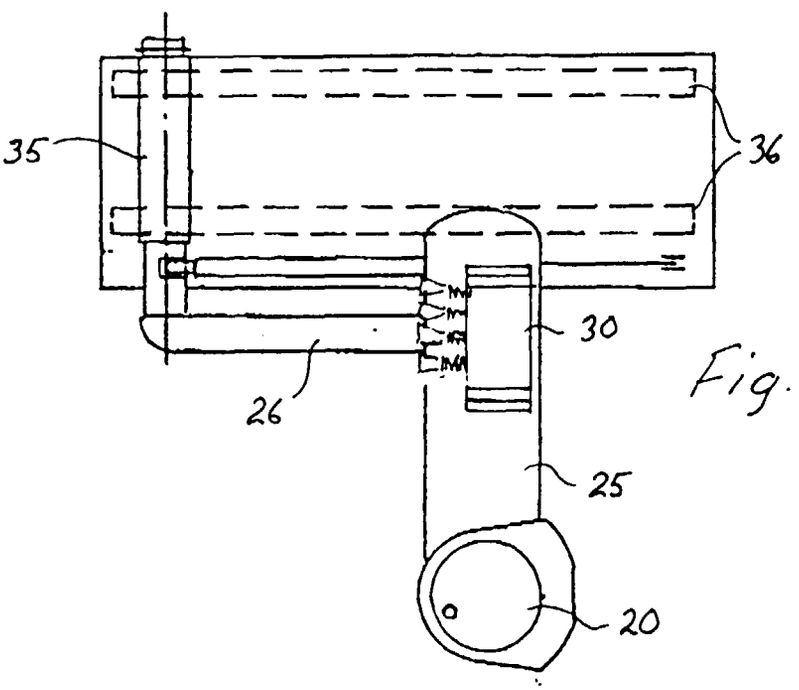


Fig. 4