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⑰ **Station for a crew member in a combat vehicle.**

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Description

The invention relates to a combat vehicle having an outer shell inside which there are stations intended for crew members, there being provided outside and above said outer shell at least one weapon, preferably a cannon, which is mounted in an unmanned turret in order to make the vehicle expose a small target area to enemy fire, this weapon partly obstructing the view around the vehicle from said crew station inside said shell.

Such a combat vehicle is previously disclosed in US—A—4,144,797. By placing the crew as low as possible and by placing the cannon above the space for the crew is gained that during battle the crew can utilize terrain formations to a great degree as protection against firing from the enemy. However, placing the cannon above the space for the crew causes considerable limitations in the possibility of sighting, as far as the crew is concerned, if only conventional observation means are used. For example, in driving up to a firing position behind a ridge there is the problem that the cannon will become visible for the enemy before the vehicle captain has any sighting possibility, with resulting risk of discovery. The vehicle captain has a sighting need all the way round the horizon at an elevation of at least $-5^{\circ}/+30^{\circ}$. Furthermore, he often needs good all round sight over the highest part of the vehicle, i.e. in this case above the cannon.

In contrast, US—A—2,388,873 discloses an entirely different kind of combat vehicle, having a manned turret. From a position above all weapons in the turret, already providing an unobstructed view, one of the crew stations in the turret can be raised further, to obtain an even better field of vision. The idea is to make it easy to reverse the direction of travel of the vehicle, without having to turn the vehicle, especially when operating in ravines. In this vehicle the raisable crew station is always located above all weapons and therefore does not have good protection.

It seems that the teaching of US—A—2,388,873 has had little influence on modern combat vehicle design. Rather, there has been a trend towards combat vehicles having the lowest possible location of the crew stations, so as to obtain good crew protection.

FR—A—2 288 294 discloses a combat vehicle where the crew is always located within the vehicle body and where a cannon can be raised to a higher position. No crew station can be raised. With the cannon in a raised position the problem of view is essentially the same as with the combat vehicle disclosed in US—A—4,144,197.

For the inventive kind of combat vehicle it has up to now been sought to solve problems of view by utilizing relatively complicated optical or electro-optical observation means with a rotatable view above the cannon. Such means have not won the approval of the users of combat vehicles.

The object of the invention is to improve the

observation facilities in a vehicle with a low-placed crew.

This object is achieved in accordance with the invention by at least one of said stations being vertically displaceable between a normal position and a raised position, said station comprising a roof portion to which is joined a peripheral wall that encloses said station, the arrangement being such that, in a normal position of said station, said roof portion constitutes a portion of said outer shell while said wall is located fully within said outer shell, said station being raisable to a position where its roof portion reaches above the turret and the weapon, for enabling temporary, unobstructed observation above the turret and the weapon, all around the vehicle, the wall of the station having at least one opening for enabling, in the normal position, direct communication with other crew members inside the vehicle, said opening being closable by means of a hatch which is adapted for automatically being taken to its closed position when the station is moved upwards.

It will thus be possible to vary the observation level according to requirements while still having available the equipment which the crew has to serve. Yet, good protection is available within the vehicle, when needed.

In a particularly advantageous embodiment, the station has regulating means for regulating the rate of vertical displacement. The roof portion can to advantage be provided with equipment for observation, suitably in the form of prismatic periscopes mounted in a rotatable cowl for observation in a complete revolution, as well as a magnifying sight for directed observation. It is also a great advantage if means are incorporated in said station for directing and firing said weapon.

The invention will now be described in detail in the following with the aid of an embodiment example illustrated on the appended drawing where:

Fig. 1 is a side view of a vehicle in accordance with the invention;

Fig. 2 is a view from above of a vehicle in accordance with the invention;

Fig. 3 is a view from above and to an enlarged scale of a station for a crewman; and

Fig. 4 illustrates, partly in section, a side view of the station in Fig. 3.

As will be seen from Figs. 1 and 2, a vehicle in accordance with the invention is provided with a forward vehicle part 2 and a rear part 3, which are joined by an articulation 4. Above the forward vehicle part 2 there is a movable, unmanned turret 5 in which a weapon 6, e.g. a high pressure cannon is mounted.

The entire crew is placed in the forward vehicle part 2 and is normally inside the outer shell 7 thereof. The vehicle captain has a station 8, the driver a station 9 and the gunner a station 10. Of these different stations intended for the different crew members, the captain's station 8 is displaceable heightwise between a normal position where a roof portion 11 incorporated in the station con-

stitutes a portion of the vehicle outer shell 7, and a raised position where the roof portion 11 is above its normal level. The station 8 is indicated in its highest position by chain-dotted lines in Fig. 1, and in this position observation above the weapon 6 and the turret 5 is possible. There is a conventional rotatable observation cowl 12 with an entry hatch 13 in the centre of the roof portion 11. The observation equipment may be such as prismatic periscopes for observation through a whole revolution, as well as a telescopic sight for directed observation. If necessary, it is naturally also possible to carry out observation with the entry hatch 13 open, independent of at what level the station 8 is.

The observation cowl 12 has been removed in Fig. 3, whereby the vehicle captain's seat 14 is visible. To the right of the seat 14 there is an operating means 15 for regulating the rate of vertical displacement for the station. This regulation is suitably infinitely variable so that a very slow movement can be obtained. The operating means 15 is also settable in a position where very rapid downward travel can be obtained, which is something which can be needful if there is a risk of being fired at. The operating means 15 actuates a vertical displacement means 16, in which there is incorporated a forward hydraulic cylinder 17 and a rear hydraulic cylinder 18, connected to a hydraulic system (not more closely illustrated) having a pressure accumulator. The station 8 is axially guided by the rear hydraulic cylinder 18 running in a ball guide.

As will be seen from Fig. 4, the station 8 is laterally defined by a wall 19 going all the way round and being united with the roof portion 11, said wall 19 being downwardly joined to a floor 20. On the side of the station 8 facing towards the remaining crew there is a communication opening 21 in the wall 19, this opening being closable by means of a sliding hatch 22. When the station 8 is in its lowermost position, the communication opening 21 is open, by having the hatch 22 moved to one side. When the station 8 is to be moved upwards, the hatch 22 is automatically closed. All the equipment required by the vehicle captain to execute his task is available in the station 8, examples of such equipment, shown in Fig. 4, being a steering means 23 and a pedal set 24.

Since the station 8 for the vehicle captain is displaceable vertically, he can choose to have a low position in the vehicle when the need of good protection is greatest, i.e. in general when his vehicle is firing, simultaneously as he has the possibility of improving his vision on other occasions by assuming a higher position. As will be seen from Fig. 2, with the illustrated vehicle it will be necessary to turn the weapon 6 somewhat towards the left to allow vertical displacement of the station 8.

Firing normally takes place from the gunner's place, but the vehicle captain should also be able to fire, usually from his lowered position. Firing should also be able to take place with the station 8 in a raised position. For good combat effective-

ness it is important for the captain to be able to inform the gunner where there is a target, so that the latter can take over the fighting task and the captain can lower his station without the crew losing contact with the target. This can be done by the gunner's sight being captive to the captain's sight/telescopic sight. It is further advantageous if the cannon can be made subordinate in the same way. A prerequisite for the captain being able to function optimally in his station 8 is naturally that the station is provided with the equipment, inter alia for communication, firing direction and observation, weapon sighting possibilities as well as means for firing weapons.

In the above example, the invention has been applied to a vehicle with articulated steering facilities, but it is also naturally possible to apply the invention to a vehicle consisting of a single vehicle part, for example, with or without a weapon.

Claims

1. A combat vehicle having an outer shell (7) inside which there are stations intended for crew members, there being provided outside and above said outer shell at least one weapon (6), preferably a cannon, which is mounted in an unmanned turret in order to make the vehicle expose a small target area to enemy fire, this weapon partly obstructing the view around the vehicle from said crew station inside said shell, characterized in that at least one (8) of said stations is vertically displaceable between a normal position and a raised position, said station comprising a roof portion (11) to which is joined a peripheral wall (19) that encloses said station, the arrangement being such that, in a normal position of said station, said roof portion constitutes a portion of said outer shell while said wall is located fully within said outer shell, said station being raisable to a position where its roof portion reaches above the turret and the weapon, for enabling temporary, unobstructed observation above the turret and the weapon, all around the vehicle, the wall (19) of the station (8) having at least one opening (21) for enabling, in the normal position, direct communication with other crew members inside the vehicle, said opening (21) being closable by means of a hatch (22) which is adapted for automatically being taken to its closed position when the station is moved upwards.

2. A combat vehicle as claimed in claim 1, characterized in that the station (8) has regulating means (15) for regulating the rate of vertical displacement.

3. A combat vehicle as claimed in claim 1, characterized in that in the roof portion (11) there is equipment (12) for observation, suitably in the form of prismatic periscopes mounted in a rotatable cowl for observation in a complete revolution, as well as a magnifying sight for directed observation.

4. A combat vehicle as claimed in claim 1,

characterized by means incorporated in the station (8) for directing and firing said weapon.

5. A combat vehicle as claimed in claim 1, characterized in that two hydraulic cylinders (17, 18) are incorporated in a vertical displacement means (16), one of said cylinders running in a ball guide for axially guiding the station.

Patentansprüche

1. Gefechtsfahrzeug mit einer Außenhülle (7), innerhalb der Plätze für Mitfahrer angeordnet sind, mit mindestens einer außerhalb der Außenhülle angeordnet, vorzugsweise als Kanone ausgebildeten Waffe (6), die auf einem unbemannten Turm angeordnet ist, damit das Fahrzeug eine kleine Zielfläche für Feindfeuer bildet, wobei die Waffe teilweise die Rundsicht von den innerhalb der Außenhülle angeordneten Mitfahrerplätzen aus verdeckt, dadurch gekennzeichnet, daß mindestens einer der Mitfahrerplätze (8) zwischen einer Grundposition und einer angehobenen Position vertikal verschiebbar ist, daß dieser Mitfahrerplatz ein Dachteil aufweist, welches mit einer den Mitfahrerplatz umschließenden Umfangswand (19) verbunden ist, wobei die Anordnung so ist, daß in der Grundposition des Mitfahrerplatzes das Dachteil einen Teil der Außenhülle bildet, während die Umfangswand vollständig innerhalb der Außenhülle angeordnet ist, daß in der angehobenen Position das Dachteil dieses Mitfahrerplatzes über den Turm und die Waffe übersteht, um zeitweilig eine ungestörte Beobachtung oberhalb des Turms und der Waffe im Rundblick zu ermöglichen, daß die Umfangswand (19) dieses Mitfahrerplatzes (8) mindestens eine Öffnung (21) aufweist, die in der Grundposition eine unmittelbare Kommunikation mit den anderen Mitfahrern innerhalb des Fahrzeugs ermöglicht und die mit Hilfe einer Klappe (22) verschließbar ist, die automatisch in ihre Schließposition gelangt, wenn der Mitfahrerplatz nach oben bewegt wird.

2. Gefechtsfahrzeug nach Anspruch 1, dadurch gekennzeichnet, daß der Mitfahrerplatz (8) Betätigungsorgane (15) zur Einstellung der vertikalen Verschiebungsrate aufweist.

3. Gefechtsfahrzeug nach Anspruch 1, dadurch gekennzeichnet, daß in dem Dachteil (11) eine Beobachtungseinrichtung angeordnet ist, die zweckmäßig als in einer drehbaren Kuppel angeordnetes prismatisches Periskop zur Rundumbeobachtung sowie als Vergrößerungsvisier für die Direktbeobachtung ausgebildet ist.

4. Gefechtsfahrzeug nach Anspruch 1, dadurch gekennzeichnet, daß in dem Mitfahrerplatz (8) Mittel zur Ausrichtung und Betätigung der Waffe angeordnet sind.

5. Gefechtsfahrzeug nach Anspruch 1, gekennzeichnet durch zwei in einer vertikalen Verschiebeeinrichtung angeordnete Hydraulik-

zylinder (17, 18), von denen einer in einer Kugelführung für die axiale Führung des Mitfahrerplatzes läuft.

5 Revendications

1. Véhicule de combat comportant une carapace extérieure (7) à l'intérieur de laquelle se trouvent des postes destinés aux membres d'équipage, au moins une arme (6), de préférence un canon, qui est montée dans une tourelle inhabitée afin de faire en sorte que le véhicule n'expose qu'une faible superficie de cible au tir ennemi étant prévue à l'extérieur et au-dessus de ladite carapace extérieure, cette arme obstruant partiellement la vue tout autour du véhicule depuis ledit poste d'équipage à l'intérieur de la carapace, caractérisé en ce qu'au moins un (8) desdits postes peut être déplacé verticalement entre une position normale et une position haute, ledit poste comprenant une partie formant toit (11) à laquelle se raccorde une paroi périphérique (19) qui enferme ledit poste, l'agencement étant tel que, dans la position normale dudit poste, la partie formant toit constitue une partie de ladite carapace extérieure tandis que ladite paroi se trouve entièrement à l'intérieur de la carapace extérieure, ledit poste pouvant être soulevé jusqu'à une position où sa partie formant toit se trouve au-dessus de la tourelle et de l'arme pour permettre momentanément une observation non obstruée au-dessus de la tourelle et de l'arme, tout autour du véhicule, la paroi (19) du poste (8) comportant au moins une ouverture (21) pour permettre, dans la position normale, une communication directe avec les autres membres d'équipage à l'intérieur du véhicule, ladite ouverture (21) pouvant être fermée au moyen d'une trappe (22) qui est adaptée pour être automatiquement amenée dans sa position fermée lorsque le poste est déplacé vers le haut.

2. Véhicule de combat selon la revendication 1, caractérisé en ce que le poste (8) comporte un moyen de régulation (15) pour la régulation de la vitesse du déplacement vertical.

3. Véhicule de combat selon la revendication 1, caractérisé en ce que dans la partie formant toit (11) se trouve un matériel (12) d'observation, de façon appropriée sous la forme de périscopes à prisme montés dans une coupole rotative destinée à une observation sur un tour complet, ainsi qu'un télescope pour une observation dirigée.

4. Véhicule de combat selon la revendication 1, caractérisé par un moyen incorporé au poste (8) pour diriger et déclencher ladite arme.

5. Véhicule de combat selon la revendication 1, caractérisé en ce que deux vérins hydrauliques (17, 18) sont incorporés dans un moyen (16) de déplacement vertical, l'un desdits vérins se déplaçant dans un guide à billes pour guider axialement le poste.

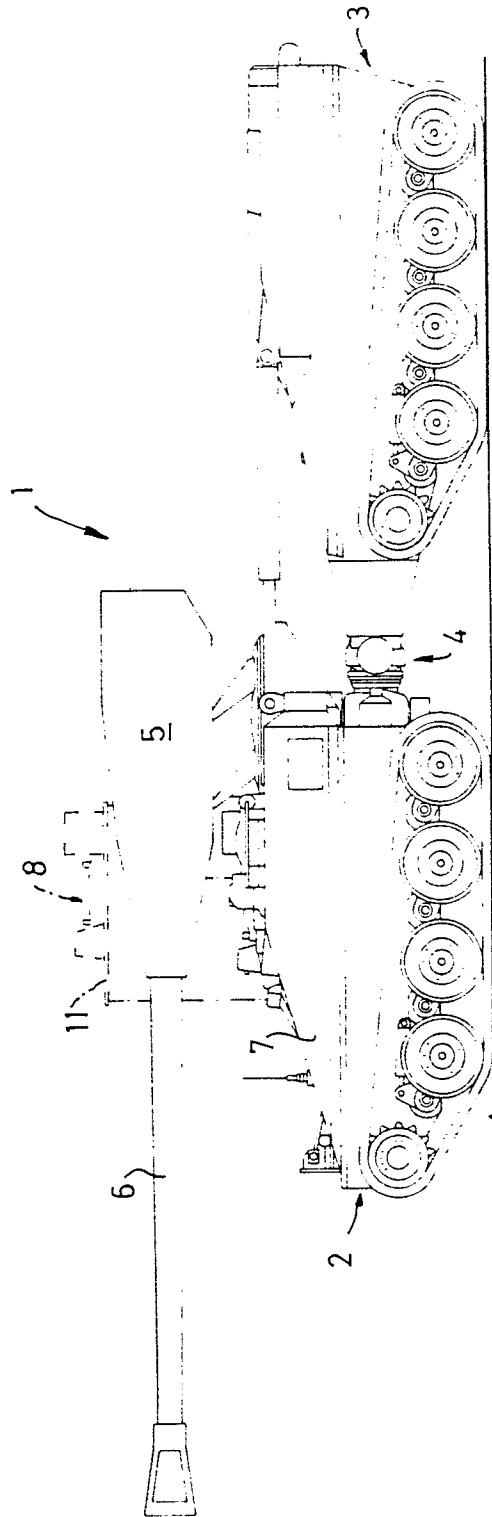
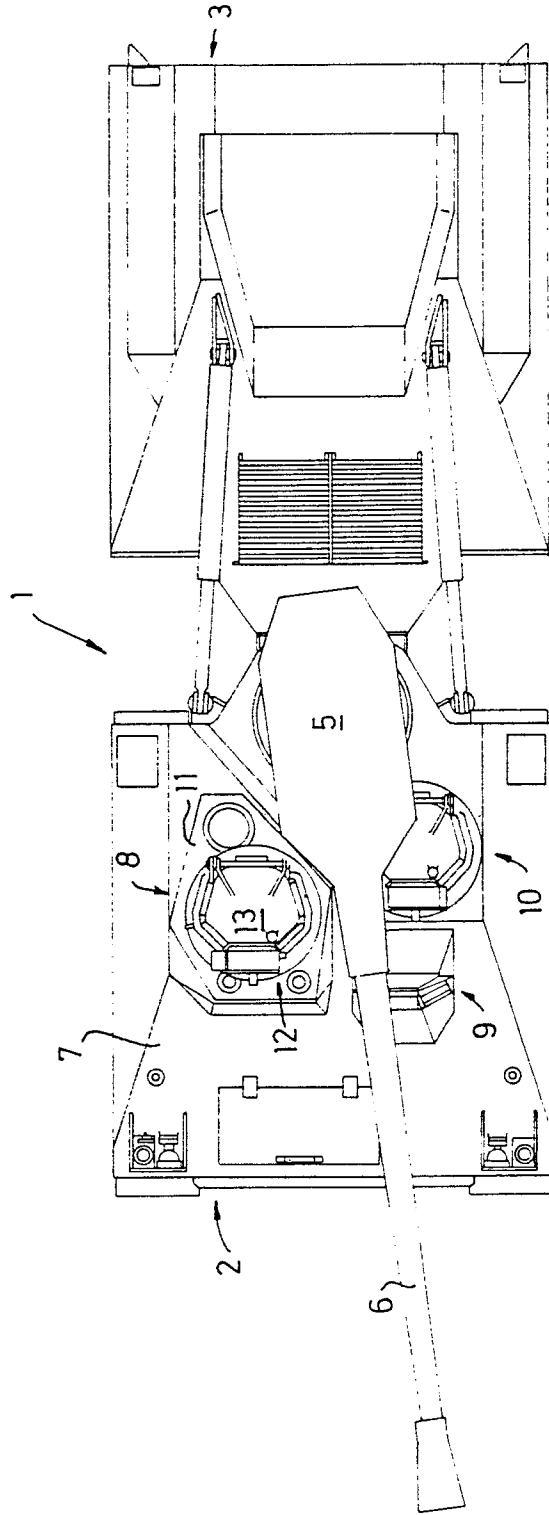


FIG.1

FIG.2



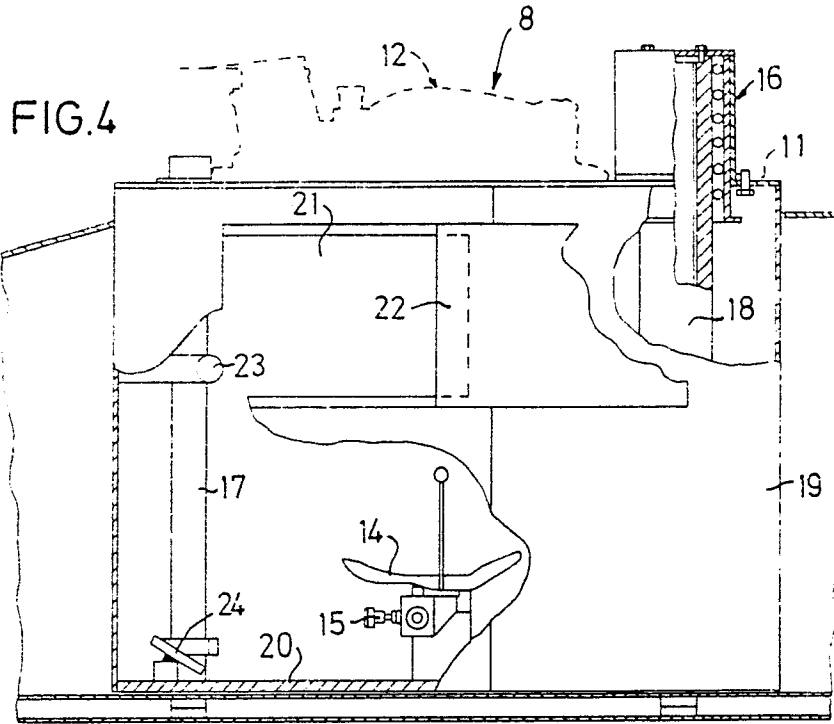


FIG. 3

