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(54) TANK TURRET

(71) We, WEGMANN CO., a Kommanditgesellschaft organised and existing under the laws of the Federal Republic of Germany of Wolfhager Strasse 77—79, 3500 Kassel, Federal Republic of Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement: —

The invention concerns a gun turret for a battle tank, particularly a rotatable gun turret, containing a crew compartment protected by armour plating of the type known as sandwich armour and which contains cavities, and to battle tanks containing such turrets.

Such gun turrets have very thick frontal and flank armour for the protection of crew in the crew compartment, for instance of a type known as sandwich armour, which contains cavities and is alternatively known as cavity armour. Since this very thick armour plating is extremely heavy, its volume has to be kept as small as possible with the result that the crew compartment has to be reduced in size as far as is practicable. This reduction is however subject to certain limits, since the gun turret has to accommodate not only the crew, consisting for example of three men, but all the essential equipment for operating the turret. Such items include electrical and electronic components, power supply units and a supply of ammunition.

According to the invention a significant reduction in weight of the heavy armour plating on the crew compartment is achievable, and furthermore extra protection for crew members against prematurely exploding ammunition is achieved.

The invention provides a battle tank turret having a crew compartment protected by heavy armour plating of the type known as sandwich armour and containing hollow spaces, in which all items of equipment for operation of the gun turret which are not functionally necessary in the crew compartment and which include a power supply unit, electrical and electronic equipment and ammunition, are located within the gun turret behind the crew compartment and separated therefrom by fireproof bulkheads, and wherein the said ammunition is located in a separated magazine with the warheads thereof pointing in a direction away from the said crew compartment.

The separation of items of equipment from the crew members ensures that the crew compartment, which has particularly heavy armour plating, can be kept very small thus reducing the weight of the armour, and furthermore that the additional equipment required in the turret can be protected by this particularly heavy armour plating, at least against frontal attacks, and still as before, be available in the turret and used for effecting for instance the rotational movements of the turret and the siting of the gun therein. A further saving of space can be achieved if gun sight(s) and periscope(s) are likewise accommodated outside the crew compartment, within a hollow space or spaces in the said heavy armour plating. The location of the sights and periscopes in the armour plating does not imply that any significant lessening of protection provided by the armour plating, providing a known type of armour plating containing hollow spaces, is used, the gun sight(s) and periscope(s) being accommodated in such hollow spaces. Of course the operating controls of such sights and periscopes may project at least partially into the said crew compartment.

The arrangement according to the invention also provides a means of overcoming yet another difficulty. The power supply unit and items of equipment including oil hydraulic units, may emit oil fumes which in conventional arrangements have contaminated the air in the crew compartment. The invention makes it possible to ventilate the areas containing the items of equipment which are separate and behind the crew compartment, independently from the said crew compartment so that no oil fumes or other air contaminating gases or fumes can reach the crew compartment, which remains cool.

The ammunition is arranged behind and separate from the crew compartment in a

magazine, so that the effects of any premature explosion of the warheads is in a direction away from the crew compartment. By this means the effect on the crew of exploding ammunition as a result for example of a direct hit thereon, is mitigated. The areas outside and behind the crew compartment containing the said items of equipment furthermore can be individually accessible from the outside by means of shutters, thus greatly facilitating maintenance work.

Loading the gun by hand, whether at a gun position or while travelling, is a process which requires a relatively large space. In order to reduce this space the weapon assembly can advantageously be arranged in such manner that it can be brought into a pre-determined position for loading, in which the breech is approximately on a level with a communicating opening to the magazine. Thus the weapon assembly can be shifted right into the crew compartment, thus permitting a considerable saving in the weight of the protective armour plating and enabling the centre of gravity of the whole system to be kept close to the axis of rotation of the turret.

The invention is hereinafter more particularly described and illustrated in the accompanying drawing, which is a schematic longitudinal plan section of a battle tank including one embodiment of a rotatable gun turret according to the invention.

Referring to the drawing, the battle tank 1 has a turret 2 which is rotatable around its vertical axis 3. The gun assembly 4 of the gun turret can rotate around the horizontal axis 5 and projects with its breech 7 well into the crew compartment 6. This crew compartment is surrounded by heavy armour plating of the sandwich type consisting of a frontal portion 8 which gives protection against frontal attacks and flank portions 9 which afford protection from flank attacks. In accordance with the invention, the power supply 10, the electrical and electronic equipment 11 and the ammunition 12 are accommodated in their own compartments behind the crew compartment and separated from the latter by fireproof bulkheads 13. The said bulkhead between the crew compartment 6 and the ammunition bin 18 can advantageously be thicker than the other bulkheads. Armour plating 14, which is lighter than that on the crew compartment, protects these additional areas. A sight and/or periscope 15 are located, as shown in the drawing, inside a cavity within the said frontal portion armour plating 8.

The rounds of ammunition are stowed in the ammunition bin 18 in such manner that the warheads 17 point to the rear, so that if the ammunition explodes as a result of a direct hit the effect of the warheads is not directed towards the crew compartment. In the bulkhead between the ammunition bin and the crew compartment there is an opening (not shown), through which the rounds to be loaded can be transferred from the ammunition bin to the crew compartment. The area in which the electronic equipment 11 and any other electrical equipment can be housed is accessible from the outside by means of shutters 19 at the rear of the tank turret. Similarly shutters or a cover (not shown) enable the ammunition bin and the area for the power supplies to be accessible from the outside. By this arrangement not only can the very heavy armour which protects the crew compartment be kept small, but all the functionally necessary equipment required in the turret is available in the turret and the functional collaboration with the crew compartment is not prejudiced. Furthermore the said arrangement prevents the air in the crew compartment from being contaminated by gases or fumes from the power supply units, and the crew compartment from becoming hot as a result of heat generated from the equipment. Locating the electronic equipment 11 in its own compartment which is shielded both from the crew compartment and from the outside by metal plates has the additional advantage that sensitive electronic equipment is protected against electromagnetic disturbance from the outside or from the operation of radio equipment in the crew compartment.

WHAT WE CLAIM IS:—

1. A battle tank turret having a crew compartment protected by heavy armour plating of the type known as sandwich armour and containing hollow spaces, in which all items of equipment for operation of the gun turret which are not functionally necessary in the crew compartment and which include a power supply unit, electrical and electronic equipment and ammunition, are located within the gun turret behind the crew compartment and separated therefrom by fireproof bulkheads, and wherein the said ammunition is located in a separate magazine with the warheads thereof pointing in a direction away from the said crew compartment.

2. A turret as claimed in Claim 1, wherein the aiming and observation equipment are located outside the crew compartment within the said hollow spaces in the said heavy armour plating.

3. A turret as claimed in Claim 1 or Claim 2, wherein areas outside and behind the said crew compartment and containing the said items, are ventilated separately from the said crew compartment.

4. A turret according to any of Claims 1 to 3, wherein the said items of equipment outside and behind the crew compartment are individually accessible from the outside through shutters.

5. A turret as claimed in Claim 3 or

Claim 4, wherein the gun assembly of the said gun turret can be brought into a predetermined position for loading in which the breech of the gun is approximately on a level with an opening which communicates with the said magazine.

6. A turret substantially as hereinbefore described and illustrated in the accompanying drawing.

7. A turret as claimed in any of Claims 1 to 6, which is a rotatable gun turret.

8. A battle tank containing a turret as claimed in any of Claims 1 to 7.

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