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ARMORED VENTILATING SHIELD

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Fig - 1 -

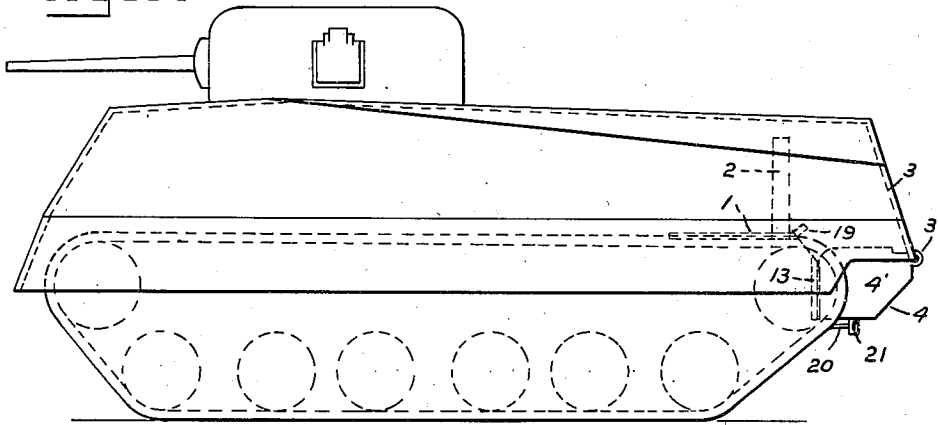
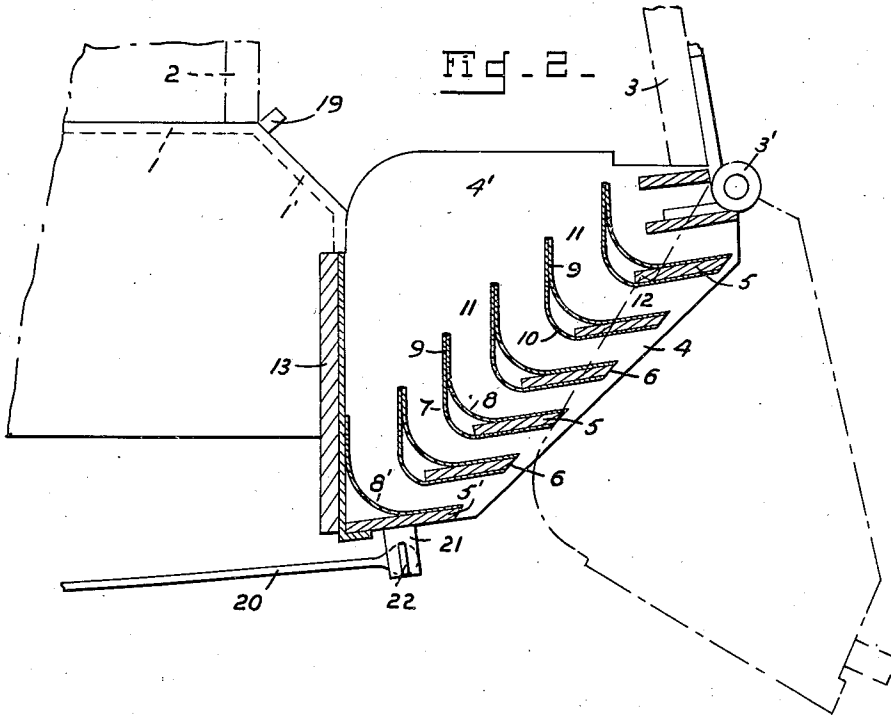


Fig - 2 -



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ARMORED VENTILATING SHIELD

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8 Claims. (Cl. 89—36)(Granted under the act of March 3, 1883, as
amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon.

The present invention pertains to a novel armored ventilating shield for use in connection with military structures such as combat tanks. Some of these tanks now in use carry a radiator protected by an armor shield spaced horizontally therefrom. The air path from the radiator to the atmosphere extends beneath the shield, and sheet metal turning vanes are there provided. These vanes are vulnerable to direct fire and ground explosions.

The object of this invention is to provide a turning vane structure having better resistance to bullet, fragmentation and explosions waves. With this object in view, there is provided beneath the aforementioned armor shield a series of spaced horizontal armor plates with sheet metal turning vanes attached thereto and directed toward the radiator. The armor plates are successively offset from one another and thus constitute an armor shield having a substantial area over the ground. Bullets or fragments projected horizontally into the spaces between the plates penetrate the sheet metal vanes and are eventually stopped by a suitably positioned armor plate. Thus, although the vanes are effective in directing air between the radiator and the atmosphere, they do not deflect bullets or fragments toward the radiator.

An illustrative embodiment of the invention is disclosed in the following description and in the accompanying drawing in which:

Figure 1 is a vertical elevation of a combat tank having an embodiment of the present invention attached thereto.

Figure 2 is a detail vertical section of the device, taken in a plane parallel to Figure 1.

The interior of the vehicle carries a horizontal supporting plate 1 near its rear end for support of the radiator 2. Horizontally rearward of the radiator is an armor plate 3 comprised in the hull for protection of the radiator from horizontal fire. Beneath the plate 3 is a space or opening 4 through which the radiator is ventilated by a stream of air which is necessarily directed rearwardly downward.

The radiator is, however, vulnerable through this opening from ground explosions and fragmentation. In order to protect the radiator therefrom and at the same time permit adequate flow of air through the opening 4, there is provided a pair of side plates 4' in the opening 4

and mounted on a hinge 3'. A series of spaced, horizontal armor plates 5 is supported between the side plates in a position transverse of the vehicle. The plates are successively offset from one another in upward progression for a purpose that will presently appear. The rear end of each plate is preferably beveled at 6 at such an angle that the downward projection of the beveled end surface does not intercept the next lower plate 5. Thus, a bullet striking one of the beveled ends will not spatter against the next lower plate although it may spatter against the next upper plate.

At the rear end of each plate 5 is provided a turning vane comprising a pair of sheet metal plates 7 and 8 secured respectively to the lower and upper surfaces of the corresponding plate 5 and bent forward and upward so that their upper edges are brought into coincidence and fastened together at 9. The upper member 8 presents a continuous concave surface from its plate 5 to its upper edge, while the next upper member 7 presents an exposed convex surface 10 opposite its next lower member 8, thereby forming an efficient air path between the radiator and the atmosphere. Because of the mutually offset relation of the plates 5 as previously described and the substantially identical construction of the turning vanes, the forward or upper ends of the latter provide inlet spaces 11 lying in a plane substantially perpendicular to the general direction of flow from the radiator to the rear opening 4. The maximum exposure of the turning vanes to the stream is thus obtained.

The sheet metal plates 7 and 8 have a thickness on the order of .020 inch. This thickness of metal will not deflect a bullet or high velocity fragment projected horizontally through the space 12 between successive plates 5, but rather will be penetrated thereby and permit the body to continue on its path in the vehicle. For protection against such bodies, a vertical armor shield 13 may be mounted forward of the series of plates 5.

The plates 5 are of sufficient hardness and thickness to resist explosion waves and fragmentation from explosions on the ground nearby which, however, are not likely to affect the more frangible turning vanes 7, 8 because of their location relatively to the plates 5. If the vanes were made of armor plate, they would deflect fragments, bullets and spatter with injurious effect to the radiator. On the other hand, if the entire turning vane structure were made of sheet metal, as in previous constructions, it would be vulnerable to ground explosions. The combination of

armor plate and sheet metal as herein disclosed affords protection from ground explosions and at the same time yields to horizontally travelling bodies without deflecting them to the radiator.

The lowermost plate 5' requires only an upper sheet metal member 8' fastened to the shield 13. A spatter shield 19 may be provided on the support 1, at the rear lower edge of the radiator, to stop any spatter that may flow along the usual sloping wall 1' of the support.

The described angle of the beveled ends 6, as previously stated, does not permit bullet spatter therefrom to interfere with the next lower turning vane. Although the spatter strikes the next upper plate 5, its deflection in the plane of the lower surface of that plate will not interfere with the curved portion of the turning vane carried thereby. Each lower member 7 is secured to its plate 5 at numerous points, as by welding, so that rupture at a few points will not destroy the vane.

An anchor rod 20 is suitably mounted in a position to be overlapped by a lug 21 carried by the bottom plate 5'. The parts 20 and 21 are fastened together by a suitable detent or pin 22. On removal of the member 22, the entire turning vane assembly may be raised on the hinge 3' for access to internal parts.

Although a specific embodiment of the invention has been shown and been described, it will be understood that various alterations may be made without departure from the spirit of the invention as indicated by the appended claims.

What I claim is:

1. In an armored structure containing a body requiring ventilation and protection, an armored shield spaced horizontally from said body and forming an air passage therebeneath, a series of spaced horizontal armor plates mounted in said passage, and turning vanes of bullet-frangible material carried by said plates and directed towards said body.

2. In an armored structure containing a body requiring ventilation and protection, an armored shield spaced horizontally from said body and forming an air passage therebeneath, a series of spaced horizontal armor plates mounted in said passage, and turning vanes of bullet-frangible material carried by said plates and directed towards said body, each plate projecting beyond the plate therebeneath at the edge more remote from said body, the free ends of said vanes lying in a plane substantially perpendicular to a flow path from said body to said passage.

3. In an armored structure containing a body requiring ventilation and protection, an armored shield spaced horizontally from said body and forming an air passage therebeneath, a series of spaced horizontal armor plates mounted in said passage, a pair of sheet metal plates secured respectively to the upper and lower surfaces of each armor plate and bent toward said body and

having their free edges fastened together to form a turning vane.

4. In an armored structure containing a body requiring ventilation and protection, an armored shield spaced horizontally from said body and forming an air passage therebeneath, a series of spaced horizontal armor plates mounted in said passage, a pair of sheet metal plates secured respectively to the upper and lower surfaces of each armor plate and bent toward said body and having their free edges fastened together to form a turning vane, the free ends of said vanes lying in a plane substantially perpendicular to a flow path from said body to said passage.

5. In an armored structure containing a body requiring ventilation and protection, an armored shield spaced horizontally from said body and forming an air passage therebeneath, a pair of parallel side plates hingedly mounted in said passage, a series of spaced horizontal armor plates carried by said side plates, turning vanes of bullet-frangible material carried by said armor plates and directed toward said body, and means for latching said side plates in said passage.

6. In an armored structure containing a body requiring ventilation and protection, an armored shield spaced horizontally from said body and forming an air passage therebeneath, a series of spaced horizontal armor plates mounted in said passage, and turning vanes of bullet-frangible material carried by said plates and directed towards said body, each plate projecting beyond the plate therebeneath at the edge more remote from said body, the free ends of said vanes lying in a plane substantially perpendicular to a flow path from said body to said passage, said remote edge of each armor plate being beveled to form a plane which, when projected, clears the next lower armor plate.

7. In an armored structure containing a body requiring ventilation and protection, an armored shield spaced horizontally from said body and forming an air passage therebeneath, a series of spaced horizontal armor plates mounted in said passage, and turning vanes of bullet-frangible material carried by said plates and directed towards said body, the edge of each plate more remote from said body being beveled to form a plane which, when projected, clears the next lower armor plate.

8. In an armored structure containing a body requiring ventilation and protection, an armored shield spaced horizontally from said body and forming an air passage therebeneath, a pair of parallel side plates hingedly mounted in said passage, a series of spaced horizontal armor plates carried by said side plates, a pair of sheet metal plates secured respectively to the upper and lower surfaces of each armor plate and bent toward said body and having their free edges fastened together to form a turning vane.

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