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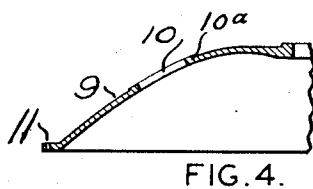
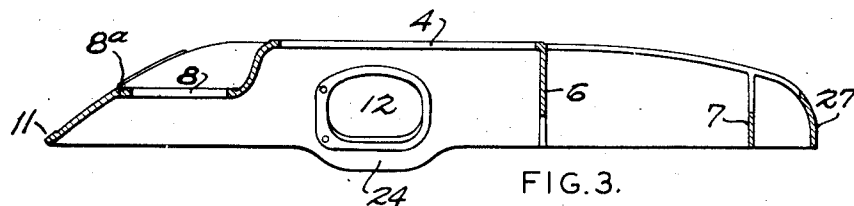
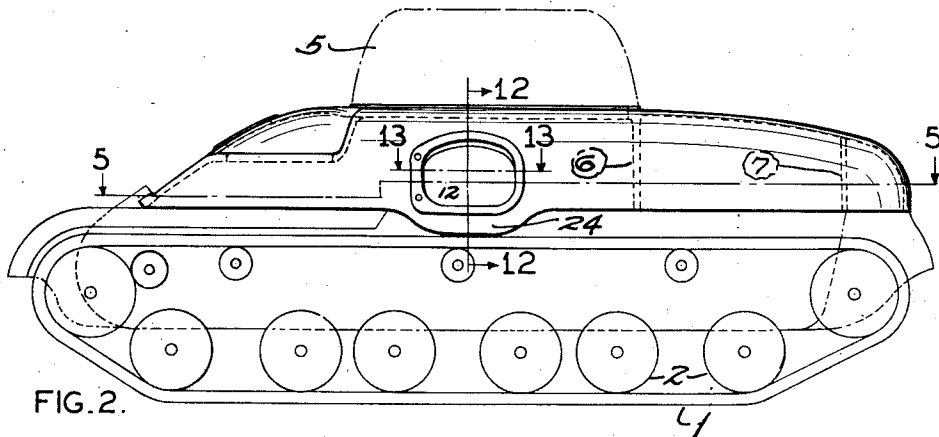
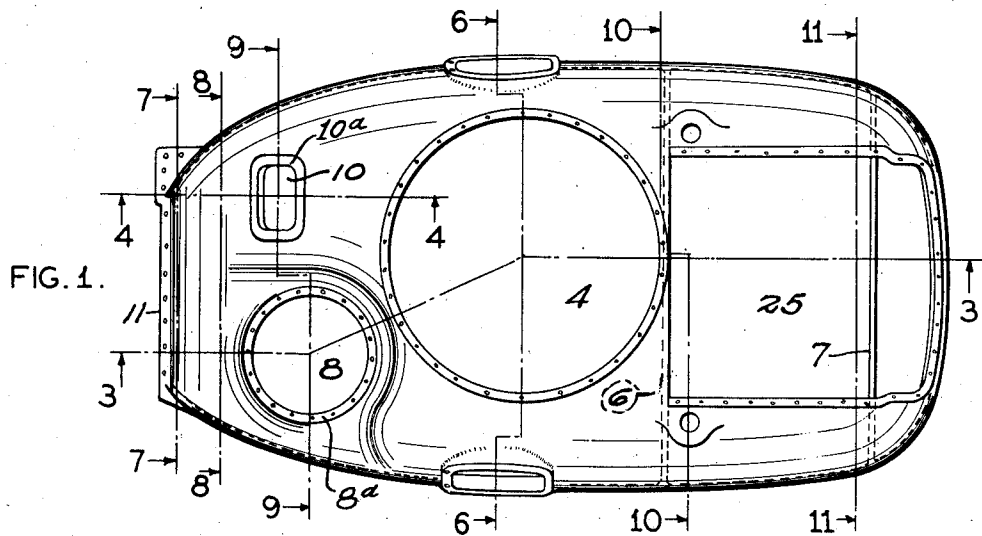
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2,361,129

BATTLE TANK

Filed June 14, 1941

3 Sheets-Sheet 1



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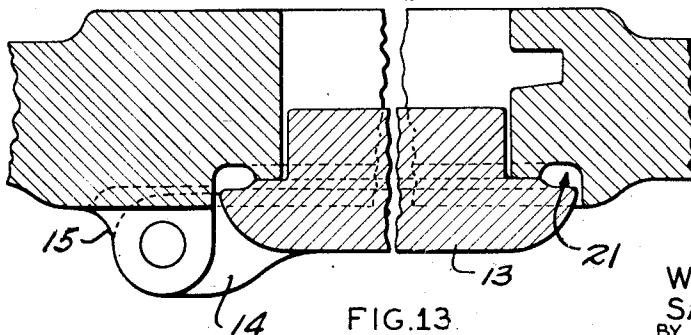
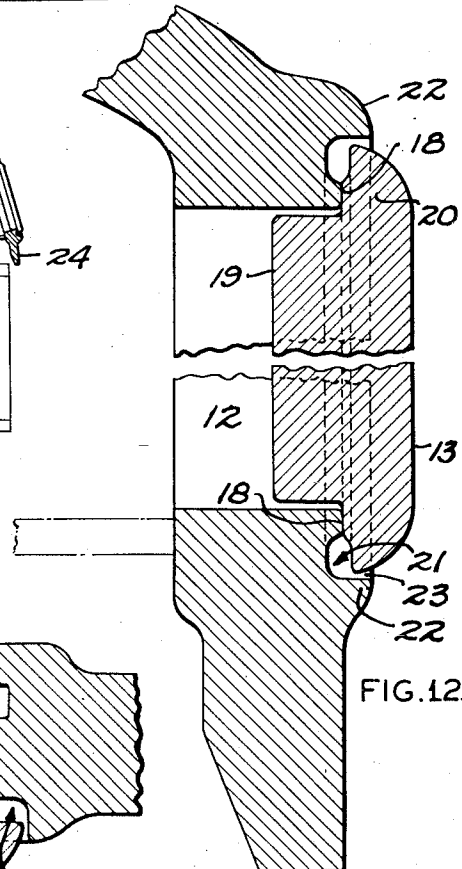
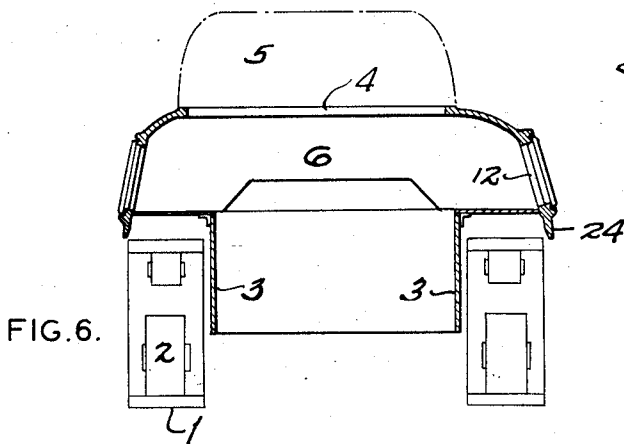
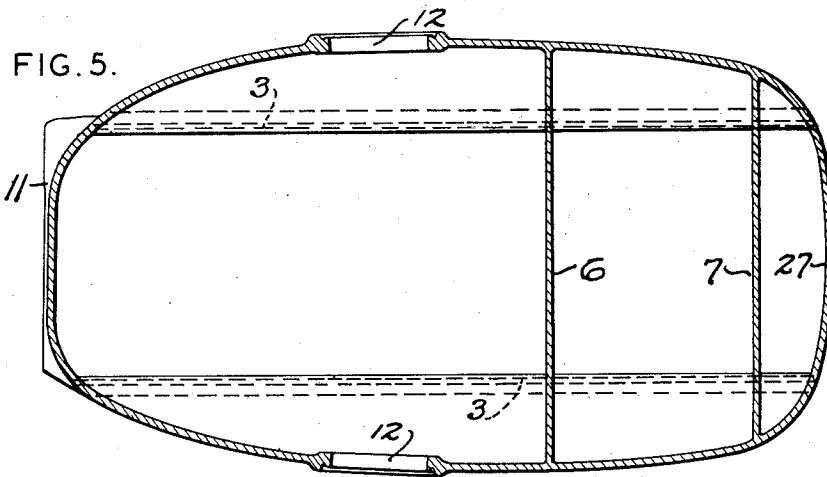
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BATTLE TANK

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3 Sheets-Sheet 2



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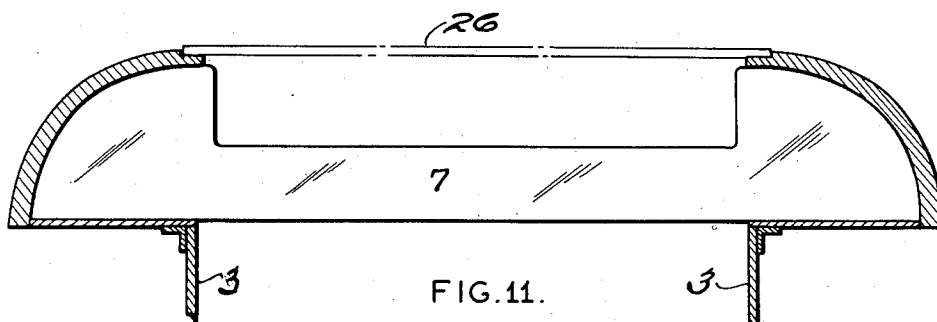
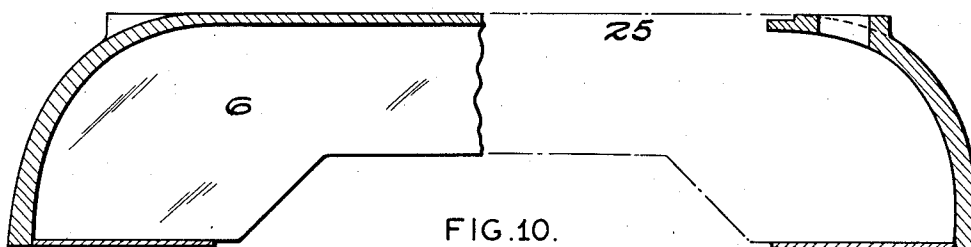
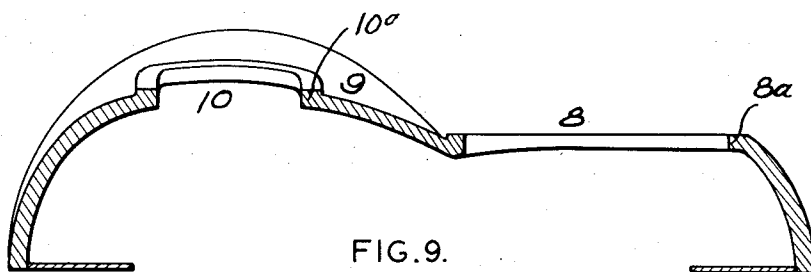
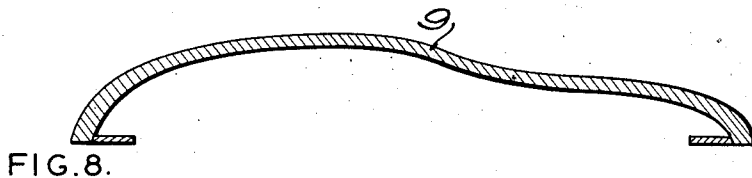
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BATTLE TANK

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3 Sheets-Sheet 3



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2,361,129

BATTLE TANK

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Application June 14, 1941, Serial No. 398,150

5 Claims. (Cl. 89—36)

This invention relates to battle tanks and comprises a one-piece, self-supporting top unit of the tank, extending upward from the chassis and supporting guns, turrets and other parts, which unit is referred to in this application as the tank 5 hull.

In ordinary tank construction, there is a chassis, on top of which is constructed an armored upper portion of rolled steel armor plates fastened together and supporting turrets, guns, etc. 10 Such armor plates are flat and have to be braced and are easily pierced by gun projectiles which strike them at right angles.

The main object of this invention is to provide a hull of armor cast steel, turtle back in shape, 15 to present an oblique surface to projectiles striking it from any direction, so as to deflect the projectiles at an angle, thus reducing the impact and penetrating effect of the projectile and forming greater protection for the crew of the tank. 20

Another object of this invention is to provide a one-piece hull, avoiding the use of rivets and bolts, which are a hazard in a tank constructed of armor plate as a projectile striking such armor plate breaks the heads off of bolts and rivets and throws the rivets and bolts into the tank and most likely injuring the men. 25

Another object is to provide the hull with necessary doors so arranged that the joints between the door and the hull will retard the speed of movement of the metal splash and prevent it from entering the tank and injuring the men therein.

Another object is to brace the turret base, against impact of the fire of guns therein, by properly shaping the hull to obtain the desired result and independently of separate or additional bracing.

Another object of the invention is to reduce the silhouette presented by the tank, and this object is attained by dropping the bottom edge of the hull side wall below the top of the sill of the tank chassis and forming thereby the bottom of a door frame in the hull, permitting the doorway to extend down substantially to the top of the chassis. 40

These and other detailed objects of the invention are attained by the structure illustrated in the accompanying drawings in which—

Figure 1 is a top view of a tank hull made in accordance with the present invention.

Figure 2 is a side elevation of the same and also indicating portions of the tank chassis.

Figure 3 is a longitudinal vertical section taken on the line 3—3 of Figure 1.

Figure 4 is a longitudinal vertical detailed section taken on the line 4—4 of Figure 1.

Figure 5 is a horizontal section taken on the line 5—5 of Figure 2.

Figures 6—11 are vertical transverse sections taken on the corresponding section lines of Figure 1, Figure 6 also indicating portions of the chassis and the main turret carried by the hull.

Figure 12 is a detailed vertical transverse section taken on the line 12—12 of Figure 2.

Figure 13 is a detailed horizontal section taken on the line 13—13 of Figure 2.

Figures 2 and 6 indicate a chassis which includes an endless track 1 associated with wheels 2 positioned outwardly of and carrying upright plates 3 forming the chassis sills which are supported on the wheels through springs and axles (not shown). The details of this structure in themselves form no part of the present invention.

The tank hull preferably consists of a one-piece casting of armor steel carried on sills 3 and having an exterior surface of general turtle back contour so that the wall of the hull is arched substantially from side to side and from end to end of the hull with the exposed surfaces facing laterally, forwardly and upwardly, all merging with each other.

The upper central portion of the hull has a relatively large circular opening 4, the annular rim of which forms a mounting for a rotating turret indicated at 5. A vertical transverse web 6 extends from side to side of the hull immediately at the rear of opening 4 and braces this part of the hull wall and rests upon the upper edges of 35 sills 3.

A relatively shorter and shallower vertical web 7 extends from side to side of the hull near its rear end and also rests upon sills 3, the hull being carried by webs 6 and 7 and by the lower transverse edges of the end walls of the hull where they cross sills 3. The one-piece cast hull is so shaped and proportioned as to possess sufficient rigidity to carry its own weight and its heavy load throughout its length and width between and beyond points of support, such as sills 3. It projects beyond the sills and overlies and projects endless track 1 and traction wheels 2.

In front of opening 4 and to one side thereof is an opening 8, the inclined hull wall being depressed sharply between openings 4 and 8 (Figure 3) and the portion of the hull wall at the sides of opening 8 being offset and flattened to provide opening 8 with an annular rim 8a which 55 lies in a substantially horizontal plane to form

a mounting for a gun frame. At the side of the longitudinal center line of the hull opposite to opening 8, the hull wall extends upwardly and rearwardly in a continuous sweep, as indicated at 9 (Figure 4), and is provided with an aperture 10, the edge of which forms a rim 10a for a visor or visor mounting, through which the operator of the tank sees to drive. The wall is curved between openings 8 and 10 to merge with rims 8a and 10a as indicated in Figure 9.

The forward edge of the hull terminates in a riveting flange 11, the lower face of which extends horizontally across the hull and rests upon suitable elements of the chassis. Between elements 6, 7 and 11 the hull is arched longitudinally and transversely of its length and this shaping enables it to sustain its weight and the weight of turret and gun structure thereon without being braced or otherwise supported throughout its intermediate portion.

Also this shaping of the hull provides for the inclination of the forwardly and laterally exposed faces obliquely to the vertical and thereby tends to deflect any projectiles striking the hull from the front and sides and delivered from substantially horizontal directions as is the course of most projectiles which would be fired at a tank.

The portions of the hull surrounding apertures 4, 8 and 10 merge with each other in smooth curves, as indicated particularly in Figures 3 and 9, so as to avoid sharp angles and perpendicular surfaces.

The hull is provided with openings 12 comprising doorways for the admission and egress of men and equipment, and each of these openings is fitted with a door 13 (Figures 12 and 13). The door has integral hinge lugs 14 mounted on co-operating hinge butts 15 integral with the hull.

The door includes a part 19, which extends well into the doorway, and a lip portion 20 which overlies the outwardly facing rim or flange 18 on the hull wall. The edge of lip portion 20 is surrounded by a beading or flange 22 projecting from the hull wall with its outer periphery inclined to the wall surface and its inner periphery forming the outer side of a channel-like recess 21 surrounding rim 18.

The shape and projection of beading 22, the restricted crevice 23 between the edge of the door and the side of channel 21, the large pocket at the inner end of crevice 23, all cooperate to deflect and baffle the admission between the door and the rim of particles of metal which result from impact of the projectile and would be likely to pass through the ordinary joint between a door and its frame.

The door and associated structure form the subject matter of a divisional application filed September 5, 1942, Serial No. 457,392.

Immediately below door opening 12 the side of the hull forms a downwardly extending rib 24 which extends below the level of the top of the chassis sill 3 and makes possible the lowering of the bottom of the door opening to more nearly the level of the bottom edge of the hull throughout the remainder of its perimeter without increasing the weight of the hull by extending its sides and ends down to the same level all around its perimeter. This reduces the area of the silhouette presented by the tank to the extent of the depth of web 24.

An opening 25 at the rear of opening 4 provides access to the engine compartment and this opening may be covered by a plate 26. At the

rear of opening 25 the corresponding portion 27 of the cast hull forms a support and merges with the remainder of the hull structure to form therewith a readily cast one-piece deflecting structure which, as pointed out in detail above, attains the general objectives of such a structure.

It will be understood that the details of the contour and other features illustrated and described may be changed without departing from the spirit of the invention, and the exclusive use of such modifications as come within the scope of the claims is contemplated.

What is claimed is:

1. In a battle tank, a chassis including spaced sill-like elements and traction mechanism supporting the same, and a hull extending outwardly beyond said elements and upwardly and over the same and comprising a wall of cast armor arched from side to side of the hull and provided with an opening in its upper face surrounded by a rim for mounting a turret, there being upright webs extending from side to side of the hull adjacent to said opening and formed integrally with said wall and supporting the hull on said elements.

2. In a battle tank, a chassis and a one-piece cast armor hull carried thereby and having a substantially turtle back contour, there being an apertured depression in an end part of said hull forming a flat annular rim for mounting a gun frame, said rim merging with the adjacent arcuate turtle back contour lines.

3. A battle tank hull having an exterior wall of general turtle back contour provided with an upwardly facing opening in its upper portion, surrounded by a rim for mounting a turret, and provided with an upwardly facing opening in its upper portion in advance of said first-mentioned opening, and surrounded by a rim for mounting a gun frame, and provided with a forwardly facing opening abreast of said second-mentioned opening and surrounded with a visor mounting rim, the portions of the said wall between said rims being curved to merge with said rims.

4. In a battle tank, a chassis including a longitudinal sill and a hull fitting over said chassis and resting on said sill, the side of said hull having a downwardly offset portion extending below the level of the top of said sill, and a door opening in the wall of said hull adjacent said portion, the bottom edge of said opening being substantially flush with the top of said sill but spaced above the lower edge of said offset portion, said downwardly offset portion merging with the wall at each side of the door opening to form a continuous lower side edge of the hull to contribute to its rigidity and render it self-supporting beyond said sill.

5. A battle tank hull having an exterior wall of general turtle back contour, including an upwardly facing upper portion and a portion extending downwardly and outwardly from said upper portion, there being an opening in said upper portion, surrounded by a rim for mounting a turret, there being a depression in said outwardly and downwardly extending portion forming an upwardly facing surface of substantial area in advance of said opening and having an opening surrounded by a rim for mounting a gun frame, the portions of said wall between said rims being curved to merge with said rims.

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