May 22, 1945. H. M. PFLAGER 2,376,720

BATTLE TANK

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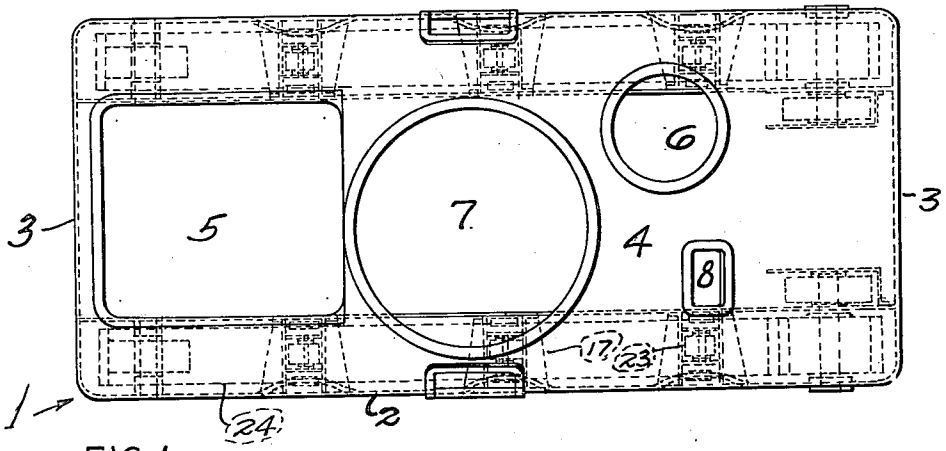


FIG. 1.

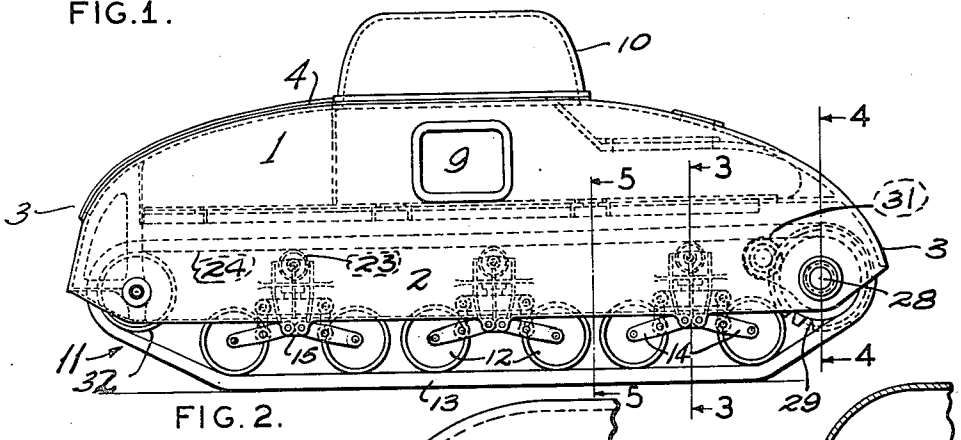


FIG. 2.

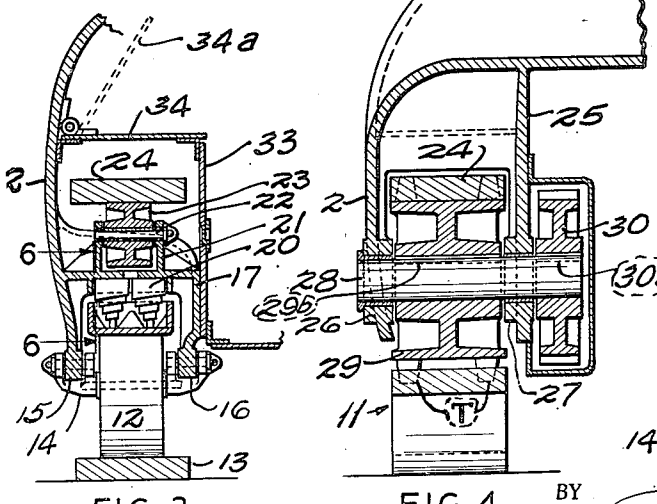


FIG. 3.

FIG. 4.

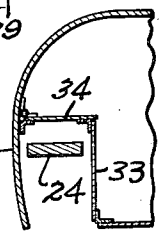


FIG. 5.

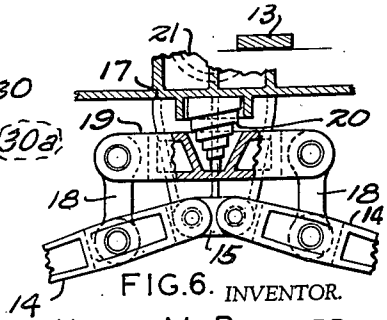


FIG. 6.

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BATTLE TANK

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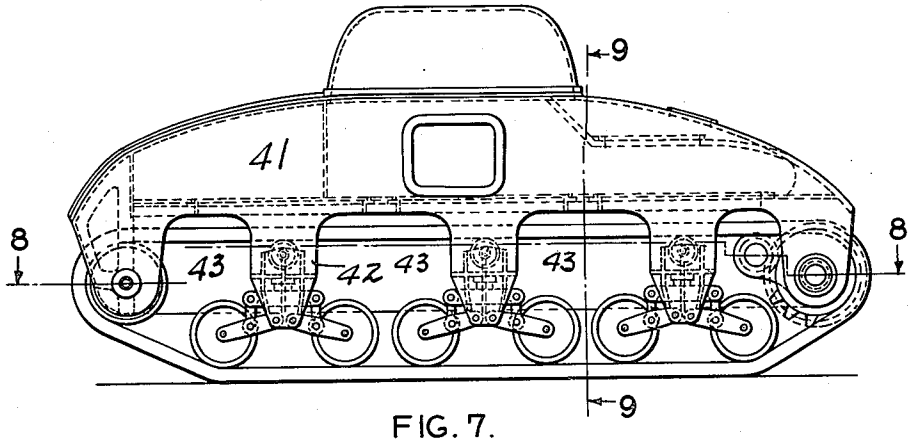


FIG. 7.

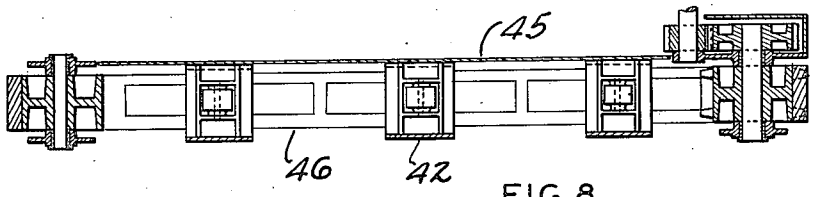


FIG. 8.

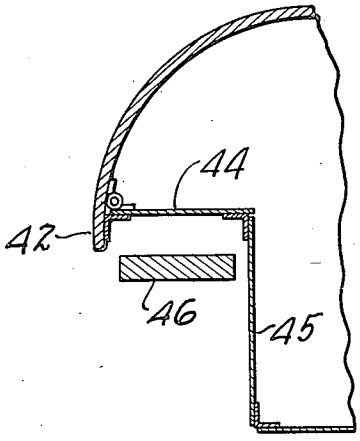


FIG. 9.

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2,376,720

BATTLE TANK

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Application August 15, 1941, Serial No. 406,959

3 Claims. (Cl. 180—9.1)

This invention relates to battle tanks and comprises a novel arrangement of a tank armored body or hull and its assembly with a running gear which supports the hull.

Preferably the hull comprises a single one-piece casting of turtle-back contour similar to that disclosed in application by W. M. Sheehan and S. T. Wharton, Jr., filed June 14, 1941, Serial No. 398,150, now Patent No. 2,361,129, dated Oct. 24, 1944 which provides an effective outer curvature for deflecting projectiles which may strike the hull.

One object of the present invention is to simplify the assembly of such a hull with its running gear by mounting the latter directly on the hull casting, thereby avoiding the use of sills in addition to the hull structure for carrying the hull and equipment mounted thereon. Preferably, the hull casting will include integral bearings for journalling and fulcruming the elements of the running gear.

Another object of the invention is to protect a substantial part of the running gear by the hull body.

Another object of the invention is to increase the strength of the hull body by the downward projection of its sides and ends below the level of the top of the running gear.

Another object of the invention is to facilitate access to the upper portion of the running gear, which object is attained by mounting the running gear on spaced brackets at the inner side of the hull and hinging a portion of the housing for the running gear to the hull side wall, which can be done readily since the housing is not required to transmit the load to the running gear.

The above and other detail objects as will appear hereafter are attained by the structures illustrated in the accompanying drawings in which—

Figure 1 is a top view of the essential features of a battle tank embodying the present invention.

Figure 2 is a side elevation of the same.

Figures 3, 4 and 5 are detail vertical transverse sections taken on the corresponding section lines of Figure 2.

Figure 6 is a detail vertical longitudinal section taken on the line 6—6 of Figure 3.

Figure 7 is a side elevation of a tank embodying another form of the invention.

Figure 8 is a horizontal section taken on the line 8—8 of Figure 7.

Figure 9 is a transverse vertical section taken on the line 9—9 of Figure 7.

The body or hull of a tank is indicated at 1 and preferably is cast in one piece in the form of an inverted bowl and includes side walls 2, end walls 3 and a top wall 4 all merging with each other in easy curves which simplifies the production of the hull and avoids corners which would be more subject to fracture or other injury by projectiles, and the substantially continuous curved surfaces increase the effectiveness of the hull in deflecting projectiles which may strike it. The hull casting is provided with openings 5, 6, 7, 8 and 9 for mounting guns or a turret, as indicated at 10, or other equipment, for ingress and egress of men, for a driver's window and other purposes.

The hull is carried by driving gear which includes an endless track 11, a series of pairs of wheels 12, which travel on the lower flight 13 of the track, there being a pair of parallel levers 14 associated with each wheel and extending towards the other wheel of the pair with their outer ends journalling the wheel axle and their inner ends pivoted to lug 15 depending from the hull side wall and lug 16 depending from a corresponding bracket 17 formed integrally with the hull side wall and extending inwardly and downwardly from a portion of the wall spaced above its lower edge. The intermediate portions of levers 14 for each pair of wheels are connected by links 18 to the opposite ends of an equalizer 19, the middle portion of which supports volute springs 20 on which rest the horizontal portion of bracket 17, thereby producing a series of yielding devices disposed longitudinally of the hull and directly supporting the same.

Upstanding lugs 21 on brackets 17 provide bearings for spindles 22 of rollers 23 over which rides the upper flight 24 of the endless track. At the forward end of the hull a vertical web 25 depends from the adjacent end wall 3 and forms, with the end wall and the adjacent portion of said wall 2, a downwardly opening housing which receives the adjacent portion of the track and is provided with bearings 26 and 27 for the shaft 28 of a sprocket 29, the teeth T of which mesh with links of track 11 to drive the latter. Shaft 28 projects inwardly through web 25 and carries the driving gear 30 which will be connected to a motor-driven pinion 31 for propelling the tank. Sprocket 29 and gear 30 are secured to shaft 28 by keys 29*b* and 30*a*.

At the rear end of the tank a similar housing

is provided for an idler sprocket **32** for the other end of the track. A vertical sheet **33** extends substantially throughout the length of the hull and is mounted upon brackets **17** and web **25** and, with a horizontal sponson **34**, forms a housing for the upper portion of the driving gear. Preferably sponson **34**, or portions thereof, are hinged to the hull side wall and are readily raised, as indicated at **34***a*, to provide access to the adjacent portion of the track for inspection, repair or cleaning of the running gear.

With this construction, a side of the cast metal hull extends downwardly below the level of the sponson and alongside of the upper portion of the running gear, protecting the latter and providing a rigid structure by which the hull is directly supported so that the heavy sponsons and sills usually provided may be eliminated. The elements integral with the hull side wall and forming brackets and housings mount the springs and track sprockets and rollers and protect the latter and the equalizers. The bearings for the equalizer supporting levers, the volute springs, the track rollers and sprockets are formed integrally with the hull. This construction eliminates the use of a large number of parts and the riveting, bolting or welding which would be required for attaching them to the hull or to a framing structure and reduces the danger to the men in the hull likely to result from loose parts forcibly disassembled by the striking of projectiles against the hull or the securing elements.

The downward extension of the hull side wall provides a much stronger arrangement to resist distortion of the hull and impacts from projectiles striking the hull above the level of the sponsons and avoids incapacitating the hull by the striking of relatively light hull supporting framework projecting below the hull, as in the usual construction.

The tank shown in Figures 7, 8 and 9 includes a hull **41** of cast armor metal having a general turtle back contour. The side wall **42** of the hull is recessed, as indicated at **43**, to provide a series of large open spaces extending downwardly from the sponson plate **44** to facilitate the discharge of mud or dirt that may tend to collect between the top flight of the track and the sponson plate or between the hull side wall and the vertical sheet **45** spaced inwardly therefrom. The downward extensions form supports and housings for the yielding devices mounting the hull, as previously described, and for the sprockets and gear by which the track **46** is driven. While the protection afforded the running gear will be of less extent than that previously described, nevertheless it will be substantial and the advantages of the simple, rugged structure effected by mounting the running gear directly upon the hull casting will be retained.

It will be understood that the details of the construction may be varied without departing from the spirit of the invention and the exclusive use of those modifications coming within the scope of the claims is contemplated.

What is claimed is:

1. In a battle tank, a cast metal hull of inverted bowl shape forming the load carrying structure of the tank and including a continuous side wall with spaced downward projections, running gear comprising an endless traction track, idlers for the same, and spaced units of wheels with yielding devices and equalizing levers, all mounted directly upon said projections and supporting the hull and tank equipment, the lower edge of the side wall between said projections being at a level above that of the upper flight of said track to provide clearance for mud and debris carried by said upper flight.

2. In a battle tank, an endless track and an associated series of wheels and spring devices disposed longitudinally of the tank at each side of the tank, a cast metal armor-forming hull of inverted bowl shape and including side walls, each side wall being provided with individual brackets projecting inwardly of the hull and, with the adjacent portion of the side wall, being assembled directly with said devices, rollers journalled on said brackets above said devices, said endless track having its upper flight over said rollers and its lower flight extending under said wheels, the inverted bowl-shaped hull, with said brackets, forming the sole means for holding said devices, wheels and track at opposite sides of the tank in spaced relation and for carrying the entire load of the tank equipment and operators, said side walls extending downwardly over substantial portions of said wheels, devices and track and protecting the same from enemy gun fire.

3. A battle tank as described in claim 2 which includes separate sheets carried by each side wall and its brackets and enclosing the adjacent rollers and the upper flight of the associated endless track, at least a portion of the enclosing sheets being hinged to the tank wall to be swung upon their hinges to provide access to the track upper flight and to the rollers.

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