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MACHINES IN PARTICULAR TO MILITARY ROADS VEHICLES
TO OBTAIN DEGREE OF BUOYANCY OF THESE MACHINES
Filed Sept. 27, 1961

Fig. 1

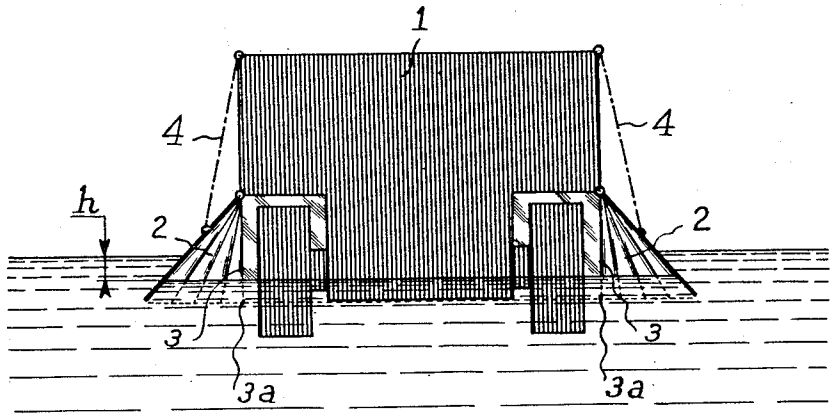
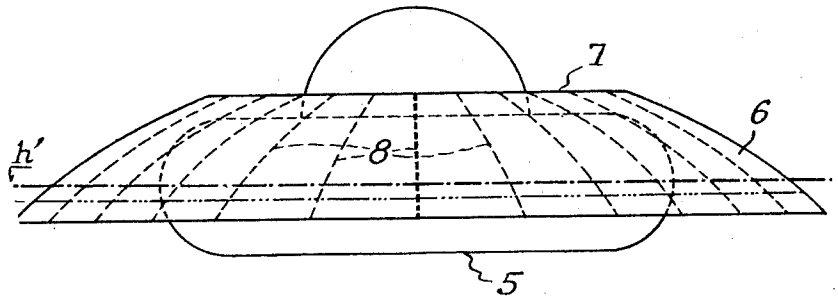


Fig. 2



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MACHINES IN PARTICULAR TO MILITARY ROADS VEHICLES TO OBTAIN DEGREE OF BUOYANCY OF THESE MACHINES

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10 Claims. (Cl. 115—1)

The present invention relates to a device by means of which a certain degree of buoyancy can be imparted to machines, and in particular to military road vehicles of the wheel or caterpillar-track type.

Various systems are already known wherein hollow, fluid-tight masses are movably mounted on a vehicle and can be disposed on the lower portion of the vehicle in such manner as to increase the flotation surface thereof.

This arrangement has the disadvantage that it requires the use of masses which are generally cumbersome and in certain cases also vulnerable, notably in connection with military applications.

The present invention relates to a device which avoids the above disadvantages while providing various further advantages.

According to the invention, a device is proposed which comprises at least one surface adapted to be opened out (unfolded) and which is of fluid-tight material, the said surface being connected in fluid-tight manner to the vehicle and delimiting an open chamber at its lower part.

According to a more special feature of the invention, the surface adapted to be opened out about the vehicle is connected thereto along a closed curve, all the points of which normally remain out of the water when the vehicle floats.

According to yet a further feature of the invention, the surface adapted to be unfolded is connected to the vehicle along a line the two ends of which are normally submerged when the vehicle floats. According to an advantageous embodiment, the inner chamber on the surface adapted to be unfolded is divided into compartments.

The invention will be more easily understood and the advantages thereof will become clear from the following description given by way of example with reference to the accompanying drawings wherein:

FIGURE 1 is a diagrammatic view of a vehicle equipped with the device according to the invention, and

FIGURE 2 is a variant of the device illustrated in FIGURE 1.

Referring to FIGURE 1, the figure shows a vehicle having a surface 2, which is adapted to be unfolded, secured in fluid-tight manner on the body 1. The said surface consists of two portions disposed, in this case, to the right and to the left of the vehicle and secured in fluid-tight manner along two lines 3 the end 3*a* of which (a single end of each line is visible in the figure) are normally submerged when the vehicle is floating. The surface 2 is water and air tight.

A diagrammatic representation is given, with the aid of dot-dash lines 4, of the means permitting the unfolding of the surface 2 and the placing in position thereof so as to float the vehicle. When it is unfolded, the surface 2 delimits a chamber which is open at its lower portion and closed at its upper portion, due to the fluid-tightness of the joint along the lines 3. When the vehicle enters the water, the air contained within the chamber delimited by the surface 2 is slightly compressed and a difference in level h is established between the exterior and the interior of the surface 2. This difference corresponds to the inner pressure of the air acting on the inner wall

of the surface 2 and also imparts to the vehicle a thrust acting in the upward direction.

In order to avoid the disadvantage of any lowering of pressure of the gas contained in the inner chamber within the surface 2, it is advantageous to provide for the exhaust of the vehicle engine into the said chamber. In this way, an excess pressure is maintained in the chamber which contributes to permanently maintaining the desired effect. Due to this arrangement, it is possible, notably in the case of a caterpillar-track vehicle, to determine the characteristics of the surface 2, in such manner that the caterpillar bands are only partially submerged, so that they can be utilized during the floating of the vehicle to provide a certain degree of propulsion for the vehicle.

If reference is now made to FIGURE 2, it will be seen that this figure illustrates a variant of the device of FIGURE 1. The vehicle 5 has, substantially, the contours of a combat car (tank) and a surface 6 adapted to be unfolded is secured to the vehicle in fluid-tight manner, along a closed periphery 7 normally above the water when the vehicle is floating. The surface 6 adapted to be unfolded has then an "umbrella" shape and may consist for example of an air and water tight fabric secured on "ribs" shown diagrammatically at 8, and capable of sliding on the said ribs. When the vehicle is displaced over the ground, the surface 6 is folded back and consequently does not in any way hinder the movements of the vehicle and, on the other hand, there is no risk of its being damaged. When the vehicle enters the water, the surface 6 is unfolded and, in the same way as before, a difference of level h' is set up between the level within the open chamber delimited by the surface 6 and the exterior of the said surface. The pressure of the air acting on the surface thus contributes to maintaining the vehicle slightly submerged in the water, and permits, where required, the utilization of its means for road propulsion, for the displacement thereof in the water.

Of course, the invention is not limited to the above embodiments which have been described by way of non-limitative example; on the contrary, it covers all variants including various devices for the unfolding or opening out of fluid-tight surfaces, either with the aid of jacks or with the aid of belt systems or other known devices; furthermore, the surface adapted to be unfolded itself may comprise any material, which is preferably but not necessarily pliable.

The surfaces 2, 6 are in effect walls or wall members.

I claim:

1. A land based vehicle comprising a mobile chassis having driving means for moving the vehicle on the ground and a fluid-tight structure laterally disposed on said chassis, said fluid-tight structure having a collapsed state in which the structure is collapsed against the chassis and an expanded state in which the structure constitutes at least one skirt flaring outwardly and downwardly of said chassis to define a chamber having a downward facing opening to increase the buoyancy of the vehicle to float the vehicle in a liquid with the driving means only partially submerged so that the driving means is effective to also at least partially drive the vehicle in the liquid, said vehicle further comprising means for selecting one of said states.

2. A vehicle as claimed in claim 1 wherein said skirt extends entirely around the vehicle.

3. A vehicle as claimed in claim 1 wherein said chamber is compartmented.

4. A vehicle as claimed in claim 1 comprising an exhaust on said chassis opening into said chamber.

5. A vehicle as claimed in claim 1 comprising means for supplying a gaseous medium to said chamber.

6. A vehicle comprising a mobile chassis and a fluid-tight structure laterally disposed on said chassis, said

fluid-tight structure having a collapsed state in which the structure is collapsed against the chassis and an expanded state in which the structure constitutes at least one skirt flaring outwardly and downwardly of said chassis, said skirt having a downwardly facing opening and defining an open chamber to increase the buoyancy of the vehicle, said vehicle further comprising means operatively coupled to said fluid-tight structure for selecting one of said states thereof.

7. A vehicle as claimed in claim 6 wherein said skirt extends entirely around the vehicle.

8. A vehicle as claimed in claim 6 wherein said chamber is compartmented.

9. A vehicle as claimed in claim 6 comprising an exhaust on said chassis opening into said chamber.

10. A vehicle as claimed in claim 6 comprising means for supplying a gaseous medium to said chamber.

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