Flotation system for vehicles on water surfaces or swamps

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FLOTATION SYSTEMS
FOR VEHICLES ON WATER SURFACES OR SWAMPS

FLOTATION SYSTEMS
FOR VEHICLES ON WATER SURFACES OR SWAMPS

STATE OF THE ART

PROBLEM

The current issue of **oil spills** and other **maritime catastrophes** has captured the world's attention due to their catastrophic effects on the environment and **loss of life**. These devastating events have highlighted **the imperative need for improved flotation systems** to reduce their impact on existing and new vessels. Conventional flotation systems, such as **keel**, **hydrofoil** and **hovercraft**, have significant limitations in terms of **energy efficiency, speed of navigation and prevention of maritime accidents.**

There does not currently exist **a flotation system** for marine vehicles on **water surfaces and marshes** that offers **substantial improvements** in **decreasing friction on the water, increasing buoyancy and reducing energy expenditure**, as described in the present invention. Therefore, **the need arises to develop an innovative flotation system** that addresses these deficiencies and provides **effective solutions** to improve **the safety and efficiency of navigation** on any type of aquatic surface.

FLOTATION SYSTEMS
FOR VEHICLES ON WATER SURFACES OR SWAMPS

DESCRIPTION
PRODUCT

The project focuses on an innovative flotation system for marine vehicles of various sizes, designed to operate on any type of water surface, including marshes. This system uses **a specialized set of wheels** and flotation spheres, which provide stability, maneuverability and efficiency. The invention stands out for reducing environmental impact, improving maritime safety and lowering operating costs.

“The Model 1 Vessel. This model stands out as a moderately sized vessel, allowing for efficient application. It is a newly designed vessel, equipped with strategically placed drive wheels and guide wheels appropriate to its size.”

FLOTATION SYSTEMS
FOR VEHICLES ON WATER SURFACES OR SWAMPS

DESCRIPTION

GUIDE WHEELS

The guide wheel is designed with specific elements that improve its **resistance and durability** in demanding sailing conditions. Its **main components** include:

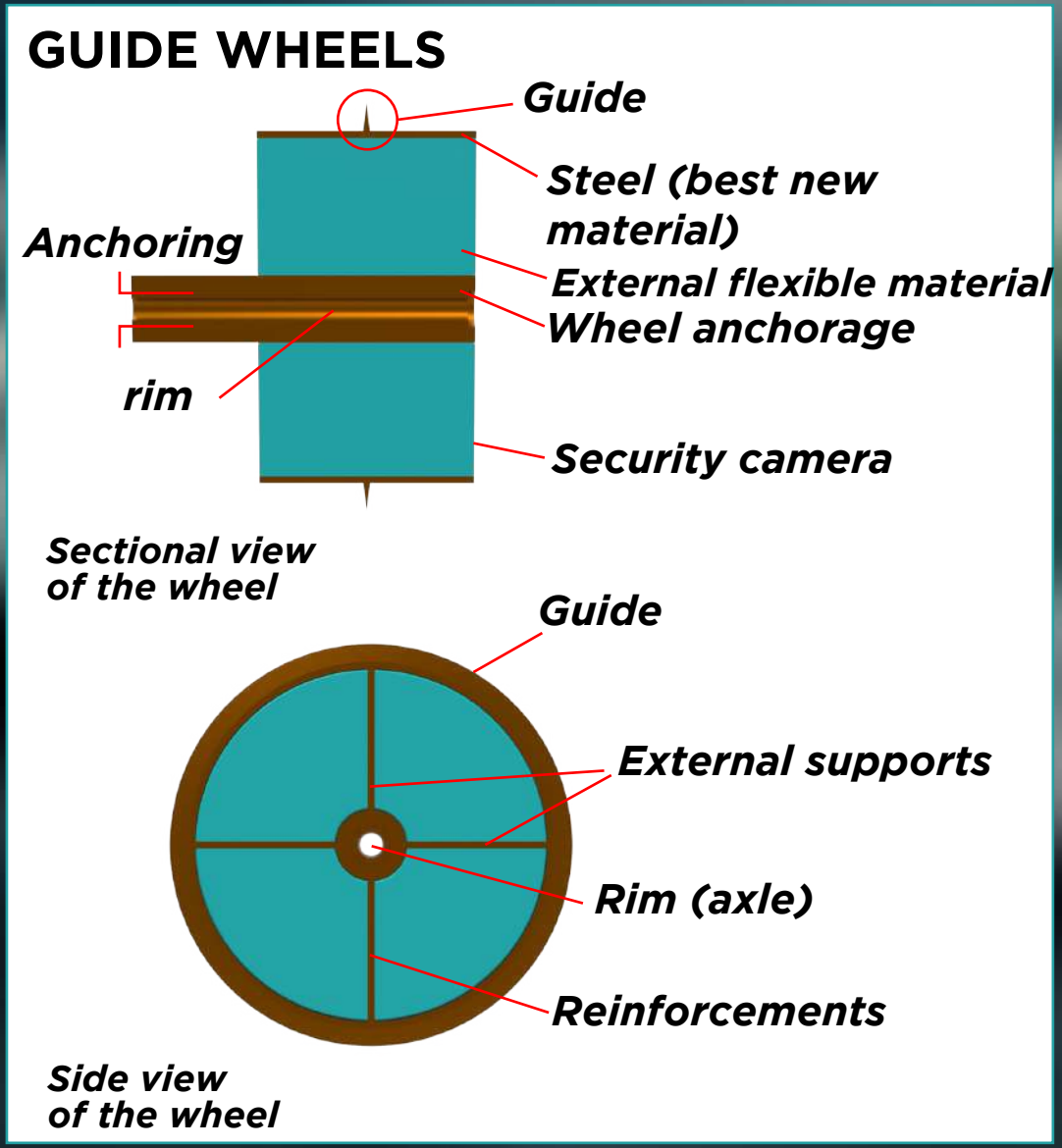
- Guides: At least one integrated guide that facilitates the steering of the boat.

- Side Reinforcements: Made of advanced materials such as steel, pneumatic or materials lighter and stronger than steel and a coating of a flexible material. These reinforcements increase the wheel's resistance to pressure and wear.

- Rim: The wheel rim is reinforced to withstand the impact of waves.

- Safety Chamber: The wheel has an internal safety chamber that protects the structure and ensures its buoyancy in case of impact or breakage of the outer layer.

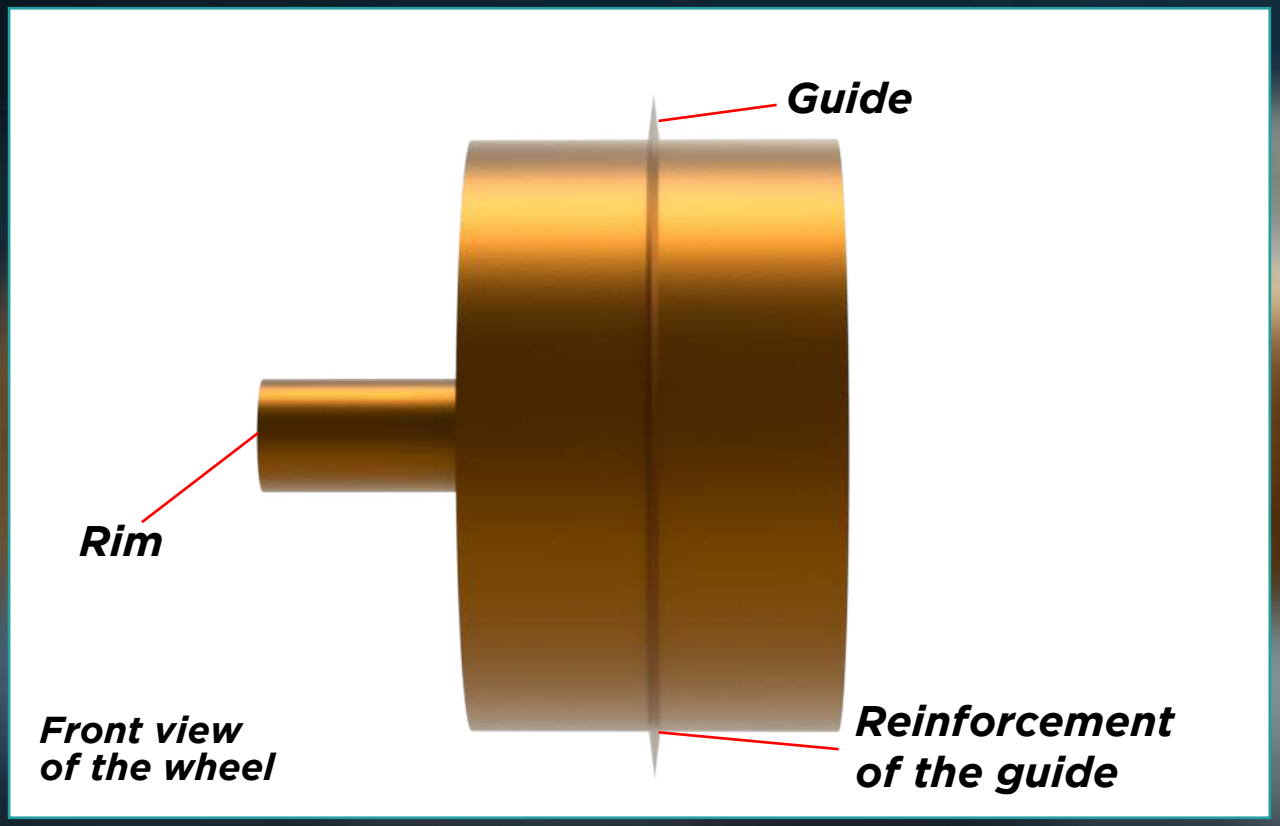
- Peripheral reinforcement: This reinforcement surrounds the wheel to increase stability and prevent deformation due to weight or forces applied in the water.



FLOTATION SYSTEMS
FOR VEHICLES ON WATER SURFACES OR SWAMPS

FUNCTIONALITY

OF THE GUIDE WHEELS



.The main purpose of the guide wheel is to **facilitate and improve the maneuverability of the boat**, acting as a fundamental component to steer and stabilize the vehicle in the water. This is especially useful in difficult environments or narrow channels or shallow water, where precise steering and stability are crucial to avoid collisions or drifts. In addition, it helps distribute the weight of the boat evenly, contributing to its buoyancy and safety during navigation.

FLOTATION SYSTEMS
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DESCRIPTION

DRIVE WHEELS

The drive wheel includes several specific elements that allow it to increase the adherence and effectiveness in the propulsion of the vehicle. Its main features are:

- **Extendable Fins:** Equipped with fins that can be extended and adjusted according to traction needs. These fins can even adopt a curved shape to improve grip in the water and optimize the vehicle's momentum.

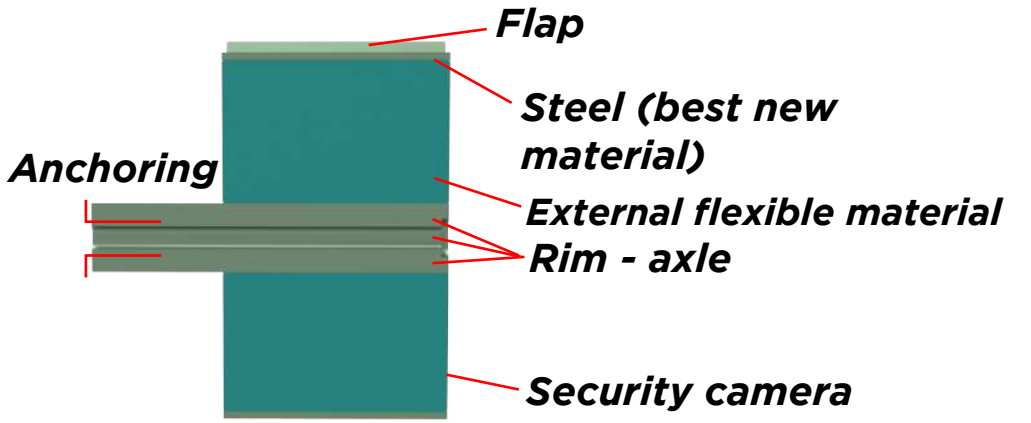
- **Lateral and Peripheral Reinforcements:** The wheel has additional reinforcements on its sides and all around its perimeter, made of lighter and stronger materials than steel. These reinforcements improve the wheel's resistance to external forces and ensure its durability in highly demanding environments.

- **Rim:** The wheel rim is reinforced to withstand full traction force.

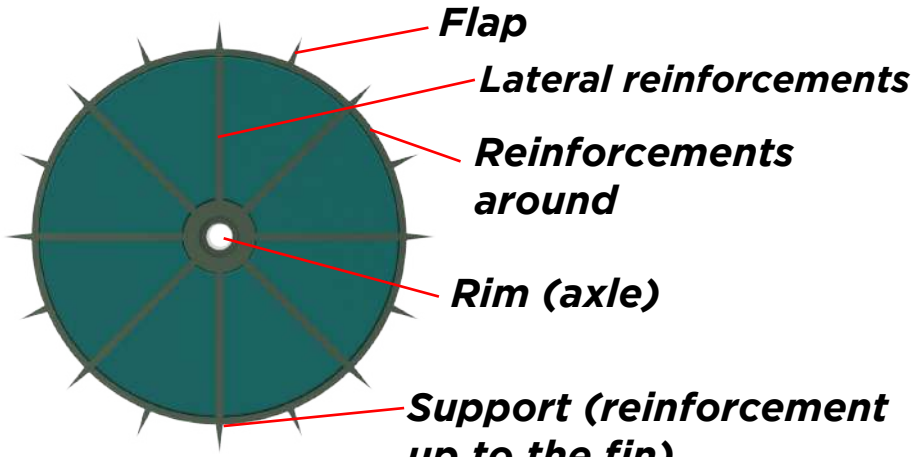
- **Safety Chamber:** A safety chamber is secured in the wheel so that, in the event of any eventuality, such as breakage of the outer layer, the structure maintains its integrity and buoyancy.

- **Reinforced Axle:** It has a reinforced central axle that supports traction and reduces wear due to continuous use.

DRIVE WHEEL



Sectional view of the wheel

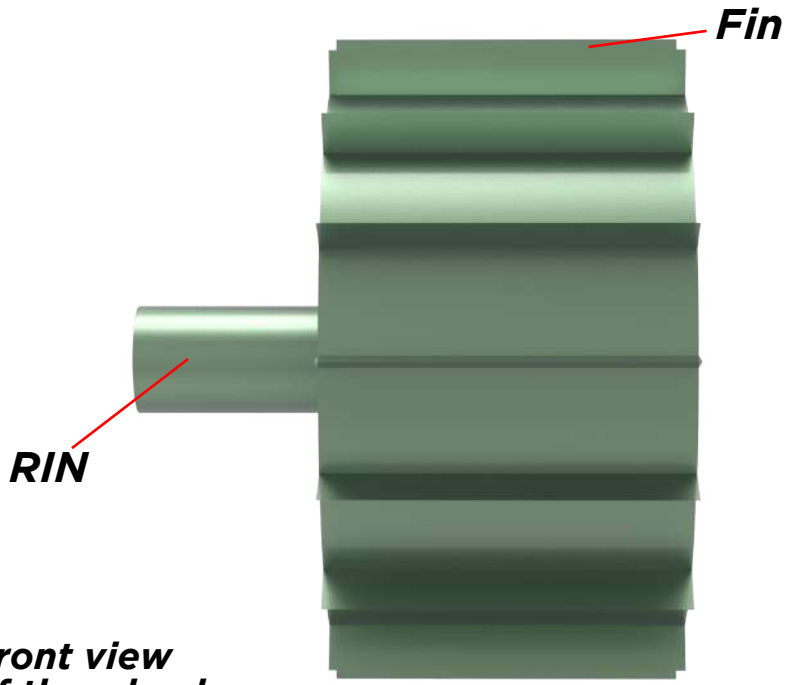


Side view of the wheel

FLOTATION SYSTEMS
FOR VEHICLES ON WATER SURFACES OR SWAMPS

FUNCTIONALITY

OF THE DRIVE WHEELS



Front view of the wheel

The main purpose of the drive wheel is to **provide the necessary momentum for the boat to move through the wate**r. It functions as a propulsion mechanism, allowing the boat to move forward in a stable and efficient manner. Adjustable fins help maximize contact with the water, increasing forward force, especially in complex water surfaces or marshes or shallow areas.

In addition, this wheel improves the overall stability of the boat by evenly distributing the pulling forces, which is key in adverse sailing conditions. In conjunction with the guide wheel, the drive wheel facilitates more controlled, economical and safer navigation by minimizing the effort required to maintain speed and heading.

DESCRIPTION

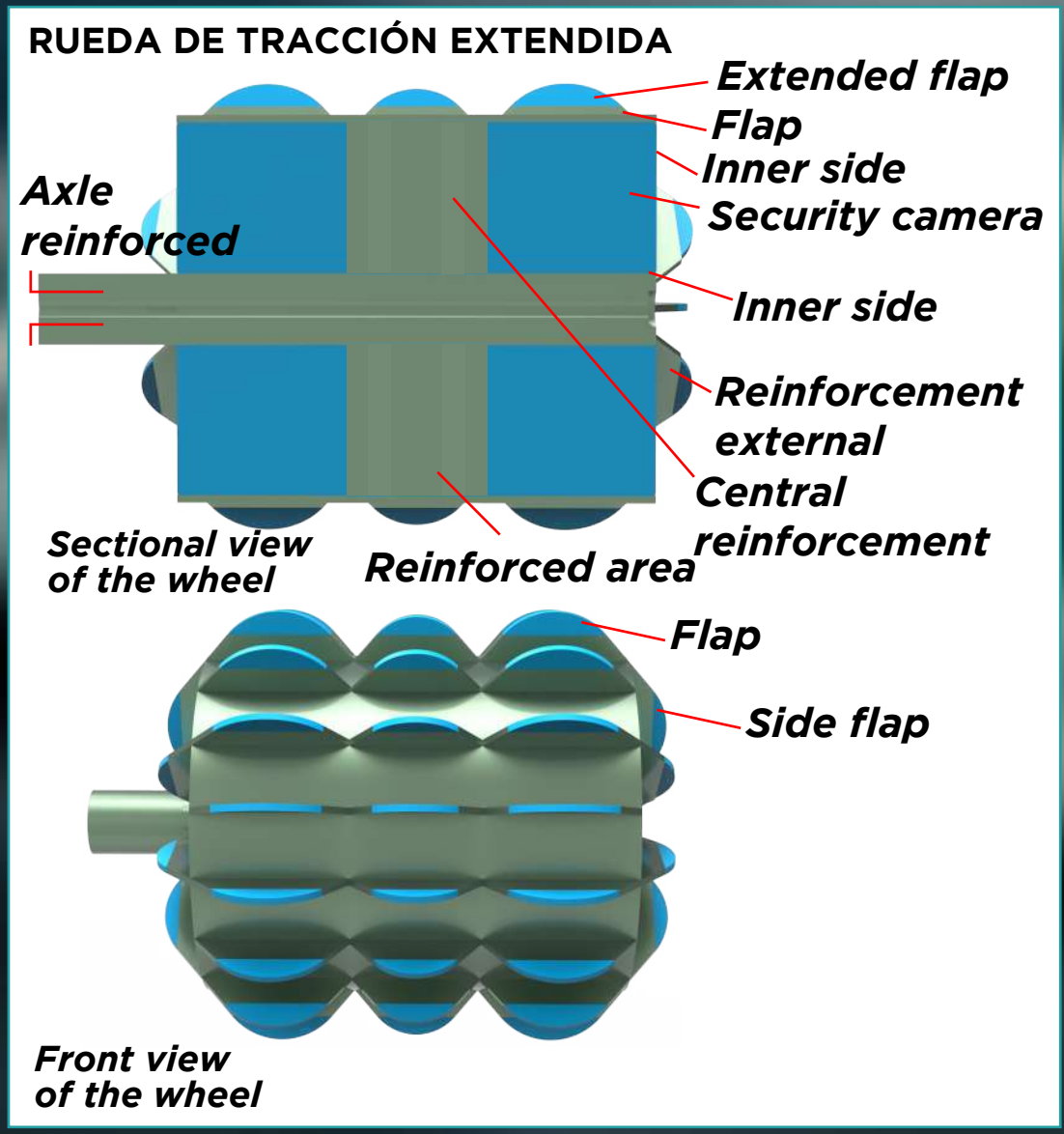
EXTENDED-WHEEL DRIVE WHEELS

This wheel includes **the features of the traditional traction wheel**, but **incorporates additional elements and specific adjustments to optimize contact and thrust in the water.** Its main features are:

- Extendable, Curved and Side Pull Fins: The extended pull wheel fins have a greater extension capability and are designed to curve in multiple directions. This feature maximizes the surface area in contact with the water, providing greater grip and reducing slippage.

- Reinforced Center Axle: Since this wheel must withstand higher tensile forces, its axle is specially reinforced to tolerate high loads and traction without compromising the wheel's integrity and stability.

- High Strength Reinforcements: The entire structure of the extended drive wheel uses high-strength, lightweight and durable materials to withstand the additional friction and mechanical stresses under high-demand conditions.



FLOTATION SYSTEMS
FOR VEHICLES ON WATER SURFACES OR SWAMPS

DESCRIPTION

“Model Ship 2 is essential as it represents a transition applicable to current vessels to increase their stability and prevent even wreckage. The image provides an insight into the function of the flotation system in water or sea vehicles, showing a current vessel in profile view. This includes flotation wheels and a boat or ship of modern design.”

FLOTATION SYSTEMS
FOR VEHICLES ON WATER SURFACES OR SWAMPS

DESCRIPTION

WATER WHEEL

The flotation wheel has **structural elements and materials** that allow it to **support large loads** and **contribute significantly to the buoyancy** of the vessel. Among its main components are:

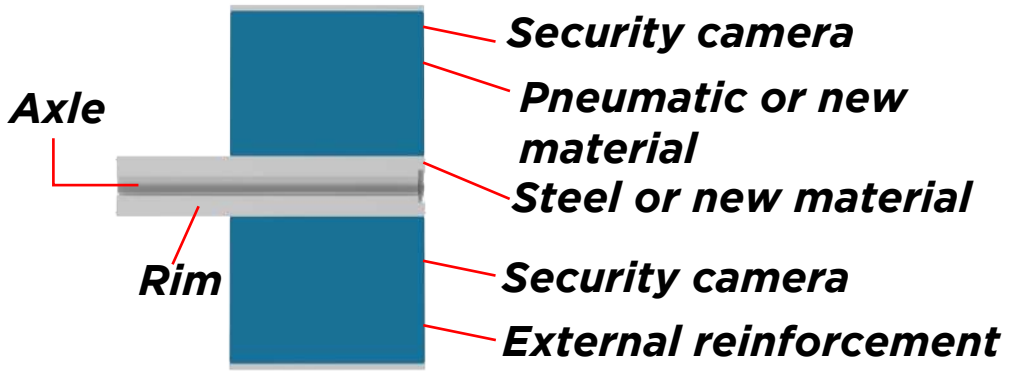
- **Internal Safety Chamber:** Designed to ensure continued buoyancy in the event of wheel damage. This chamber prevents water from entering the interior and maintains buoyancy.

- **Steel or Resistant Material Reinforcements:** The wheel structure includes reinforcements made of steel or innovative materials that are lighter and more durable than steel, allowing it to support weight and withstand adverse marine conditions.

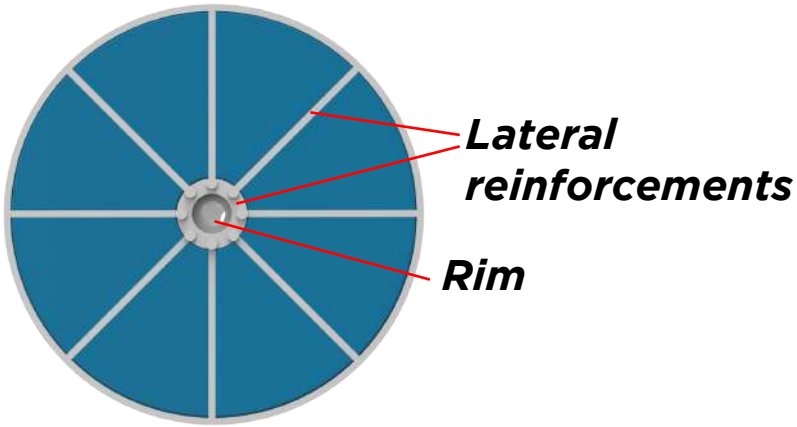
- **Peripheral and External Reinforcement:** A peripheral reinforcement surrounds the entire circumference of the wheel, while an additional external reinforcement ensures that the wheel maintains its shape and stability. These reinforcements protect the wheel against deformation caused by the weight of the boat or external impacts.

- **Reinforced Rim:** The wheel rim is reinforced to improve its durability and resistance to friction and wear from constant contact with water and other elements in the environment.

WATER WHEEL



Sectional view of the wheel



Side view of the wheel

FLOTATION SYSTEMS
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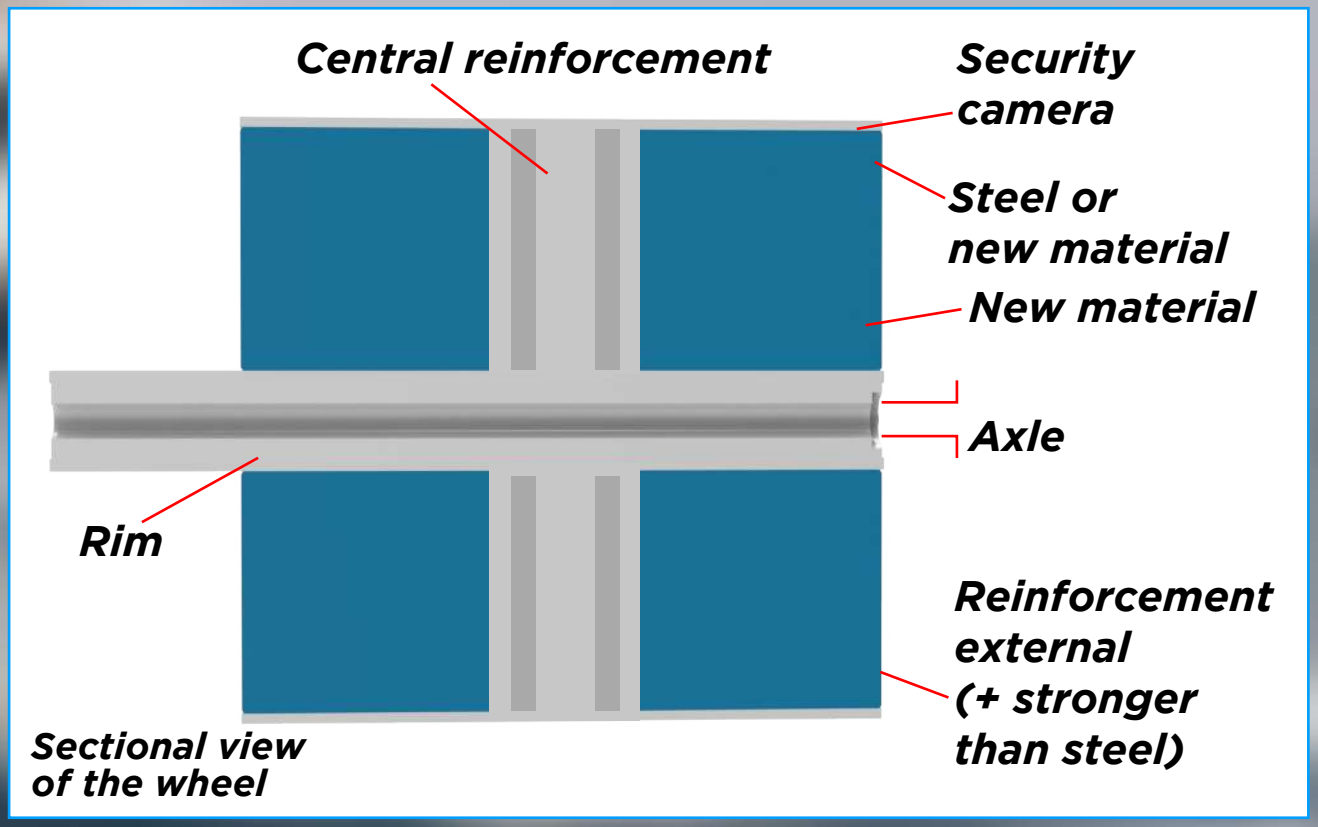
FUNCTIONALITY

OF THE EXTENDED FLOATING WHEEL



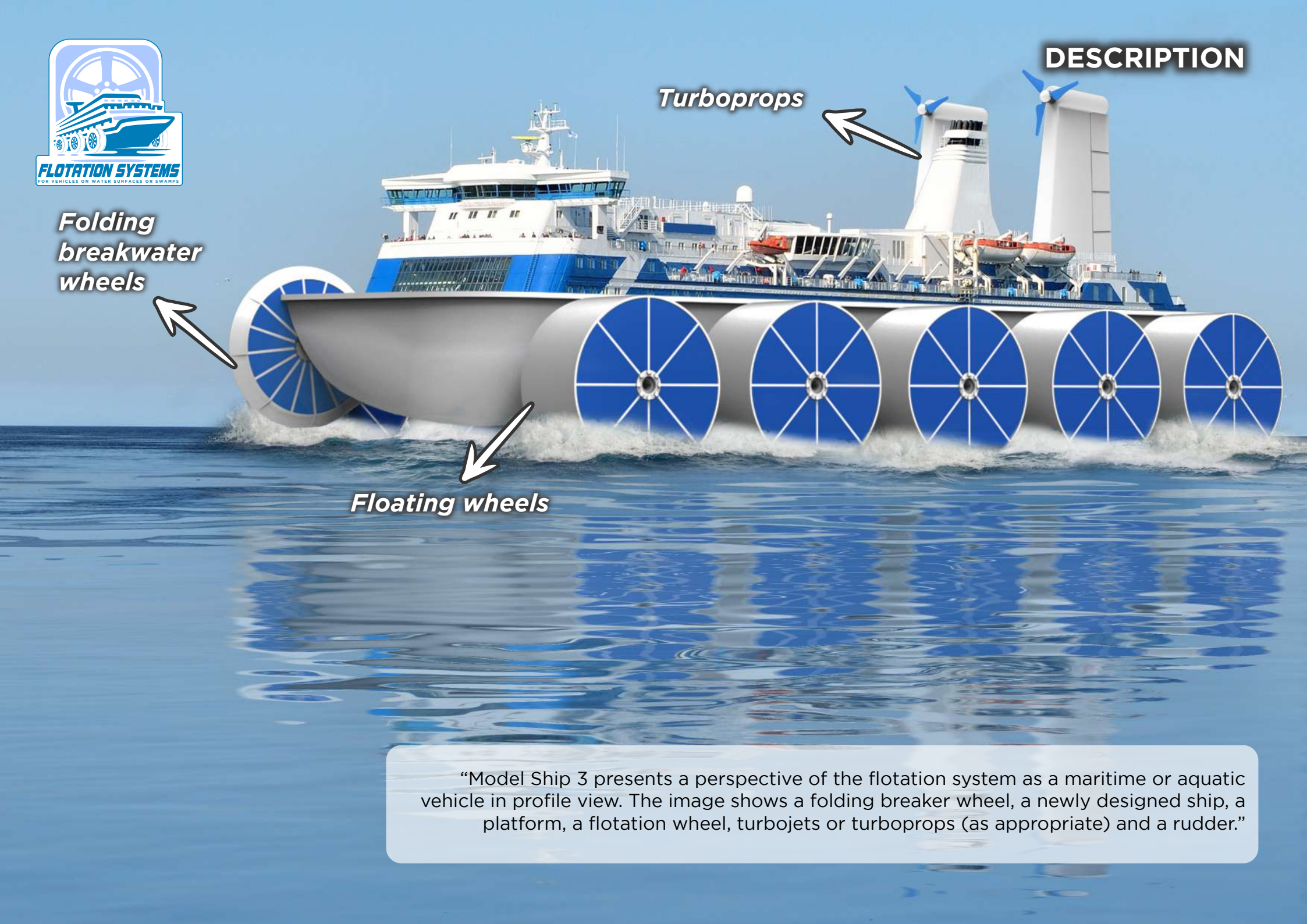
Sectional view of the wheel

It is intended to **provide additional buoyancy and superior stability** for boats in demanding conditions. With a more robust structure and several safety chambers, this wheel allows:

- Support of higher loads without compromising
compromising buoyancy.
- Improved stability in deep and rough waters.
- Increased safety and control in critical maneuvers, such as loading and rescue.

FLOTATION SYSTEMS
FOR VEHICLES ON WATER SURFACES OR SWAMPS

DESCRIPTION



"Model Ship 3 presents a perspective of the flotation system as a maritime or aquatic vehicle in profile view. The image shows a folding breaker wheel, a newly designed ship, a platform, a flotation wheel, turbojets or turboprops (as appropriate) and a rudder."

FLOTATION SYSTEMS
FOR VEHICLES ON WATER SURFACES OR SWAMPS

DESCRIPTION

BREAKWATER WHEEL

The breaker wheel is designed with **features that make it effective in breaking the water** and dissipating the energy of the waves before they directly impact the vessel. Among its main elements are:

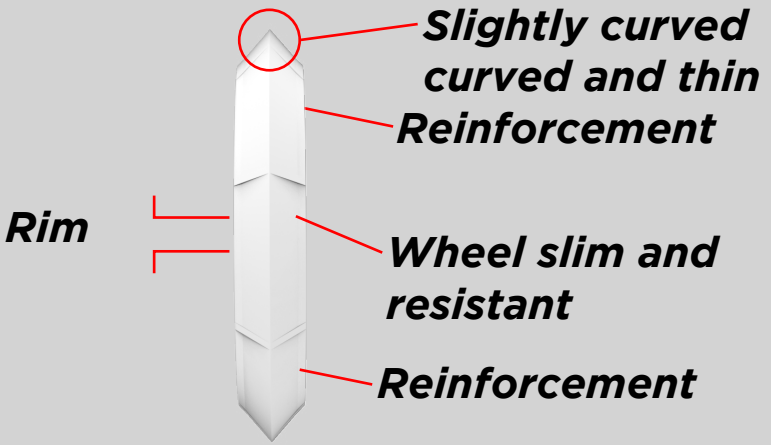
- Curved and Bent Keel: The wheel itself incorporates a slightly curved keel that helps channel and deflect the force of the waves. This curved shape allows for better penetration of the water, dispersing its energy and minimizing the impact on the vehicle.

- Side Reinforcements and High-Strength Materials: The materials used in the wheel are especially lightweight but stronger than steel, ensuring durability and resistance to strong wave conditions.

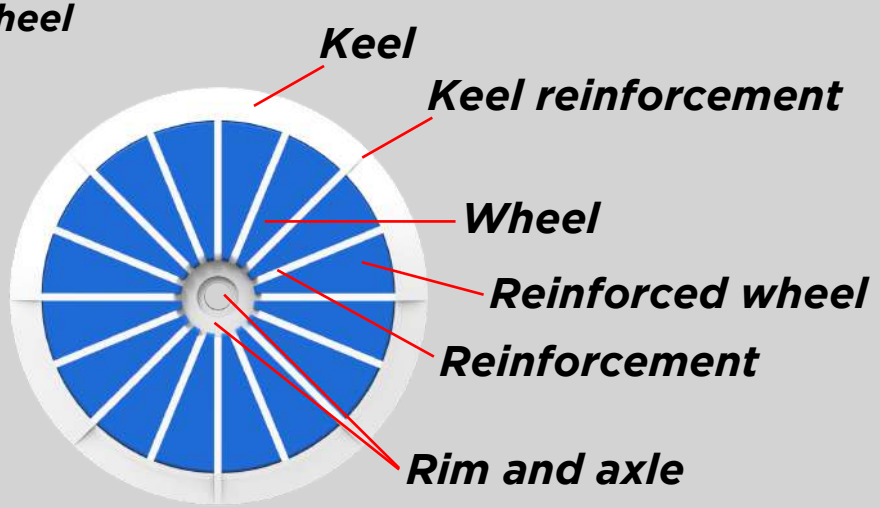
- Acute Angle of Attack: The breakwater wheel is set at a specific angle of attack to improve its effectiveness in dispersing waves. This angle helps direct waves away from the vessel and reduces the impact they could have on its structure.

- Ship's Platform Mounting: The wheel is integrated into the vessel's structure at key points to act as a first line of defense against waves. On larger vessels, this wheel can be installed together with several additional wheels to form a complete angle-of-attack breakwater system that can be hinged.

BREAKWATER OR BREAKER WHEEL



Front view of the wheel



Side view of the wheel

FLOTATION SYSTEMS
FOR VEHICLES ON WATER SURFACES OR SWAMPS

FUNCTIONALITY

OF THE BREAKWATER WHEEL

The main purpose of the breakwater wheel is to **protect the vessel by dissipating the energy of the waves** before they directly affect its structure. **This provides multiple benefits in navigation:**

- Stability and Safety: The breakwater wheel reduces the intensity of the vessel's rolling motion, improving stability in rough waters and protecting both the vessel and its cargo.

- Optimized Navigation in Adverse Waters: Allows smoother navigation in rough seas or marshy environments, making operation possible in areas where it would otherwise be difficult or dangerous.

- Damping for Delicate Maneuvers: By reducing the impact of waves, this wheel enables safe maneuvers in embarkation and disembarkation areas, as well as in rescue or cargo situations.

FLOTATION SYSTEMS
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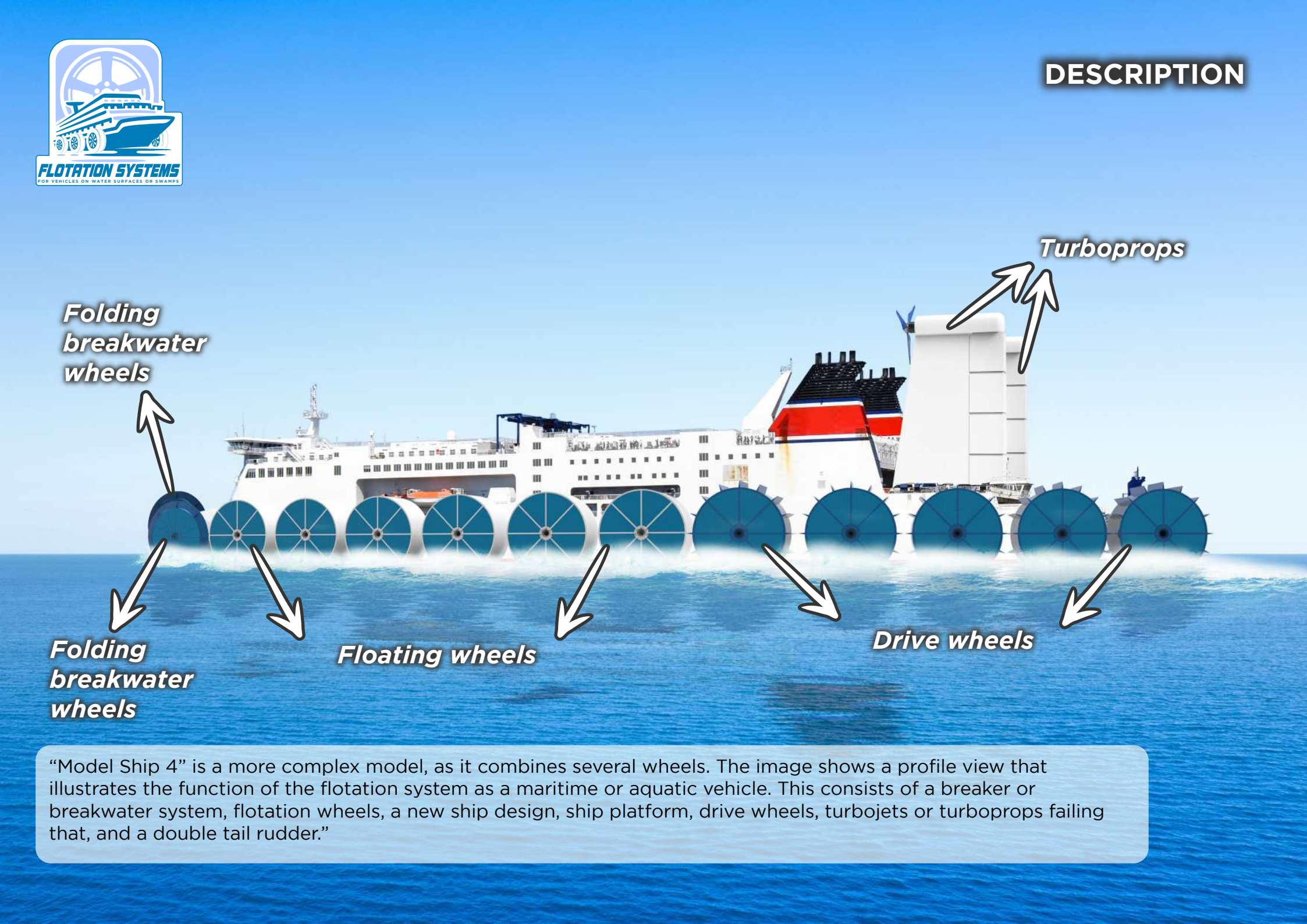
DESCRIPTION

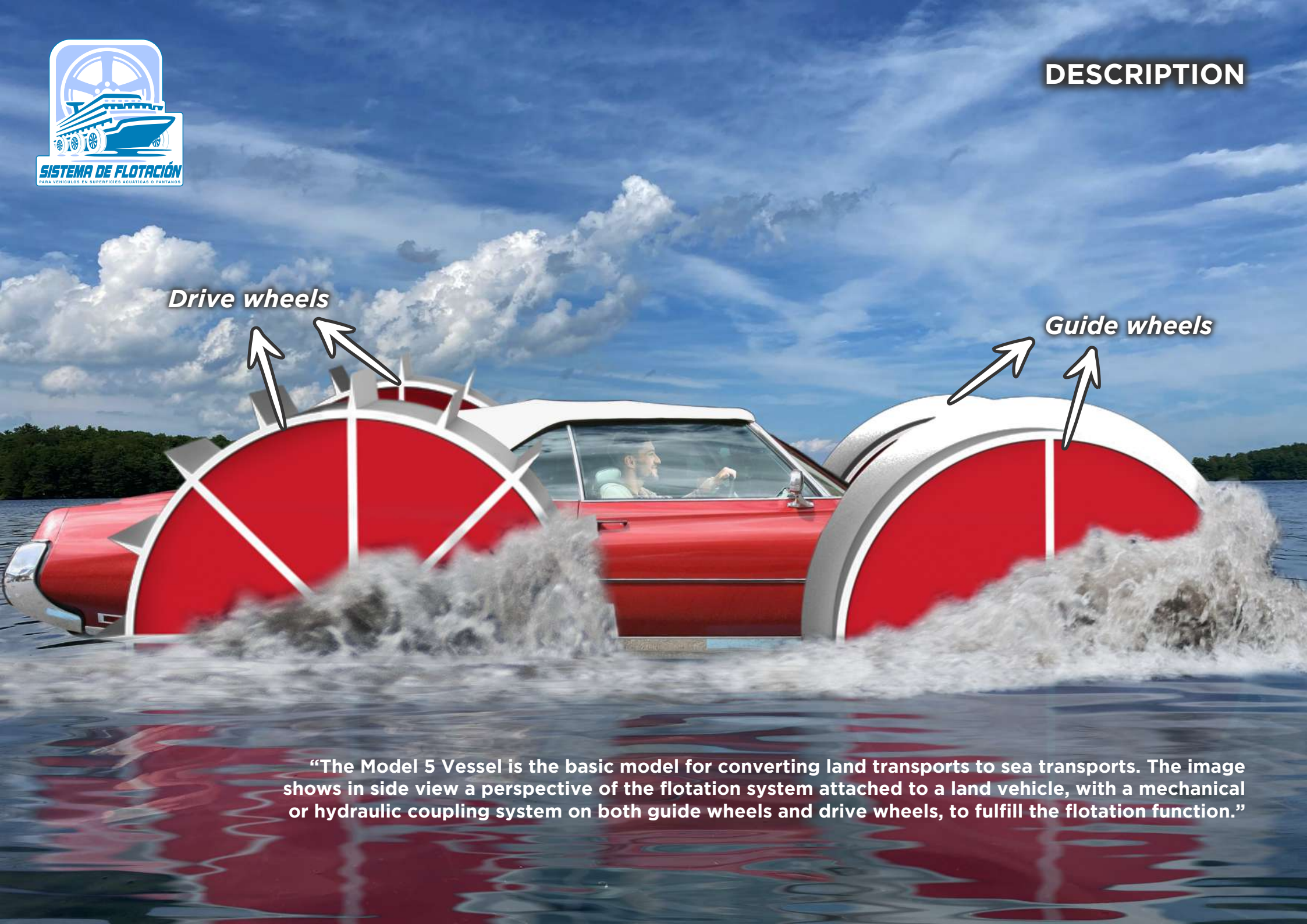


“Model Ship 4” is a more complex model, as it combines several wheels. The image shows a profile view that illustrates the function of the flotation system as a maritime or aquatic vehicle. This consists of a breaker or breakwater system, flotation wheels, a new ship design, ship platform, drive wheels, turbojets or turboprops failing that, and a double tail rudder.”

SISTEMA DE FLOTACIÓN

PARA VEHÍCULOS EN SUPERFICIES ACUÁTICAS O PANTANOS

DESCRIPTION



“The Model 5 Vessel is the basic model for converting land transports to sea transports. The image shows in side view a perspective of the flotation system attached to a land vehicle, with a mechanical or hydraulic coupling system on both guide wheels and drive wheels, to fulfill the flotation function.”

FLOTATION SYSTEMS
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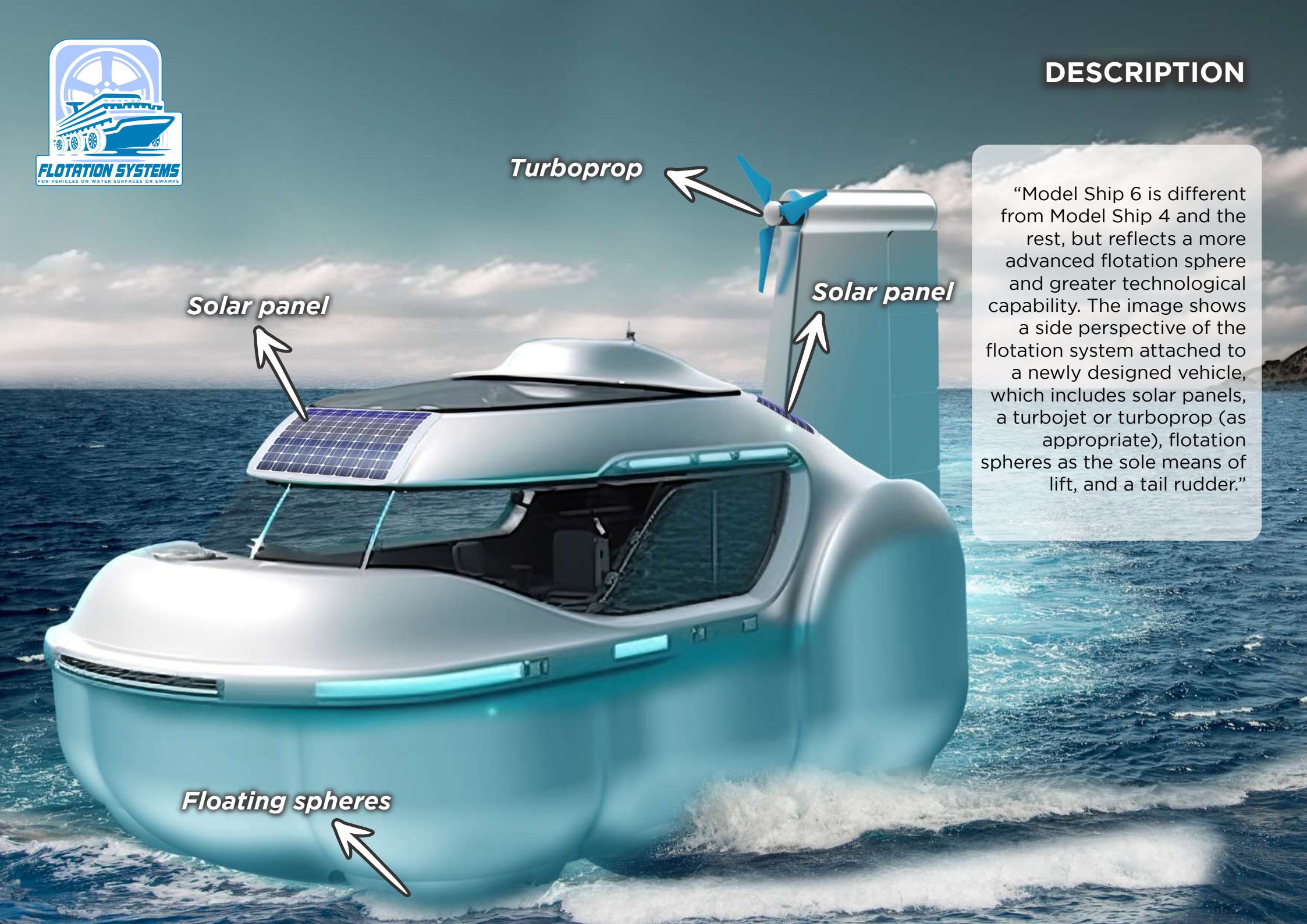
DESCRIPTION

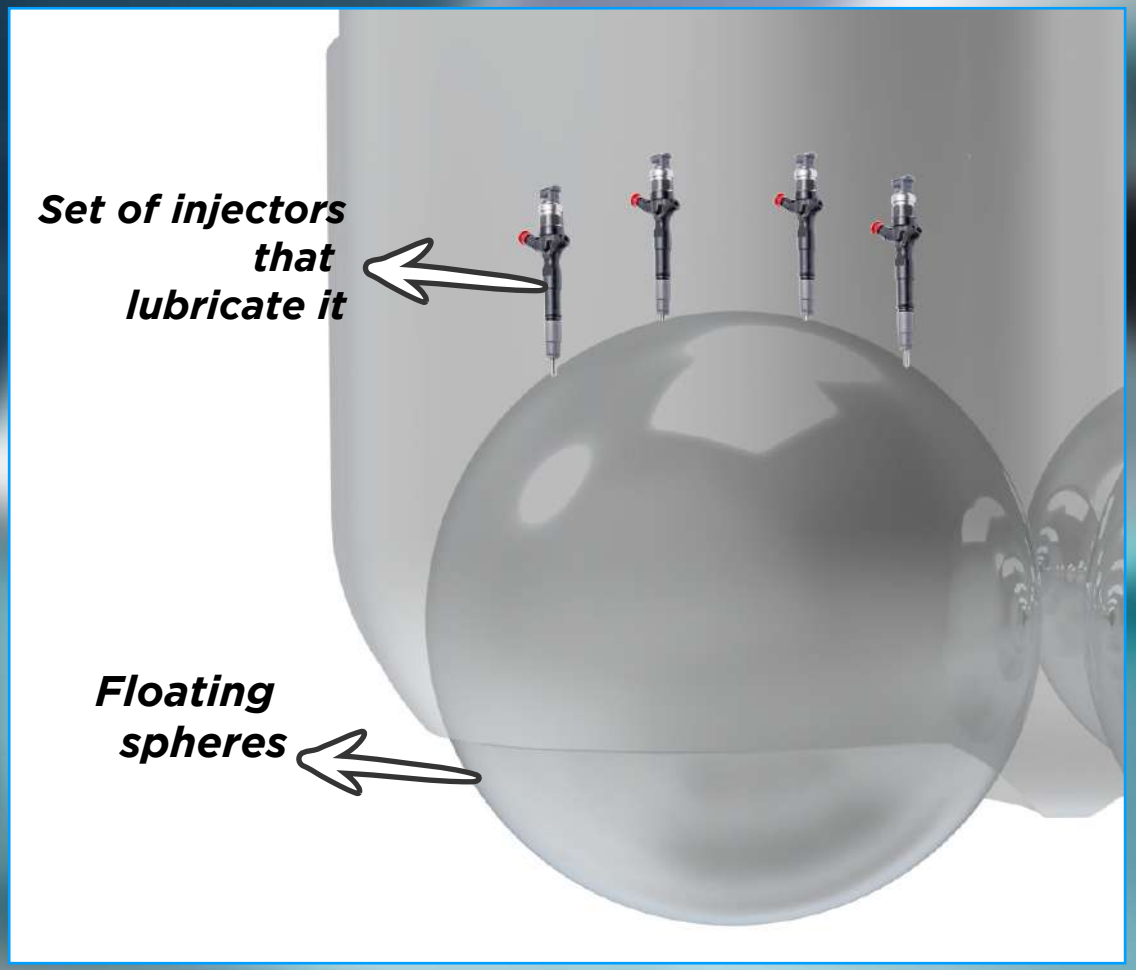


"Model Ship 6 is different from Model Ship 4 and the rest, but reflects a more advanced flotation sphere and greater technological capability. The image shows a side perspective of the flotation system attached to a newly designed vehicle, which includes solar panels, a turbojet or turboprop (as appropriate), flotation spheres as the sole means of lift, and a tail rudder."

FLOTATION SYSTEMS
FOR VEHICLES ON WATER SURFACES OR SWAMPS

DESCRIPTION

FLOTATION SPHERE



The buoyancy sphere is a specialized component of the flotation system, designed to provide additional buoyancy support and resistance in the water. Its spherical shape and advanced materials allow it to withstand impacts and minimize friction, ensuring a more efficient displacement of the vessel.

- Resistant Materials: It is made of materials that offer high resistance to wear, impact and friction, which is essential for demanding aquatic environments.

- Lubrication System: The sphere includes a set of nozzles that keep it lubricated, reducing wear where it is housed and resistance in the water.

- Spherical Shape: Its spherical design evenly distributes buoyancy and drag forces, increasing the boat's stability.

FLOTATION SYSTEMS
FOR VEHICLES ON WATER SURFACES OR SWAMPS

FUNCTIONALITY

OF THE FLOTATION SPHERE

The main purpose of the buoyancy sphere is to provide buoyancy support and reduce friction during displacement. Specific benefits include:

- **Additional Stability:** Its shape allows the boat to remain balanced, even in sudden movements.

- **Reduced Drag:** Constant lubrication minimizes friction with the water, allowing for smoother and more efficient sailing.

- **Versatility of Use:** The sphere can be combined with other components of the flotation system to improve buoyancy in boats of different sizes and designs.

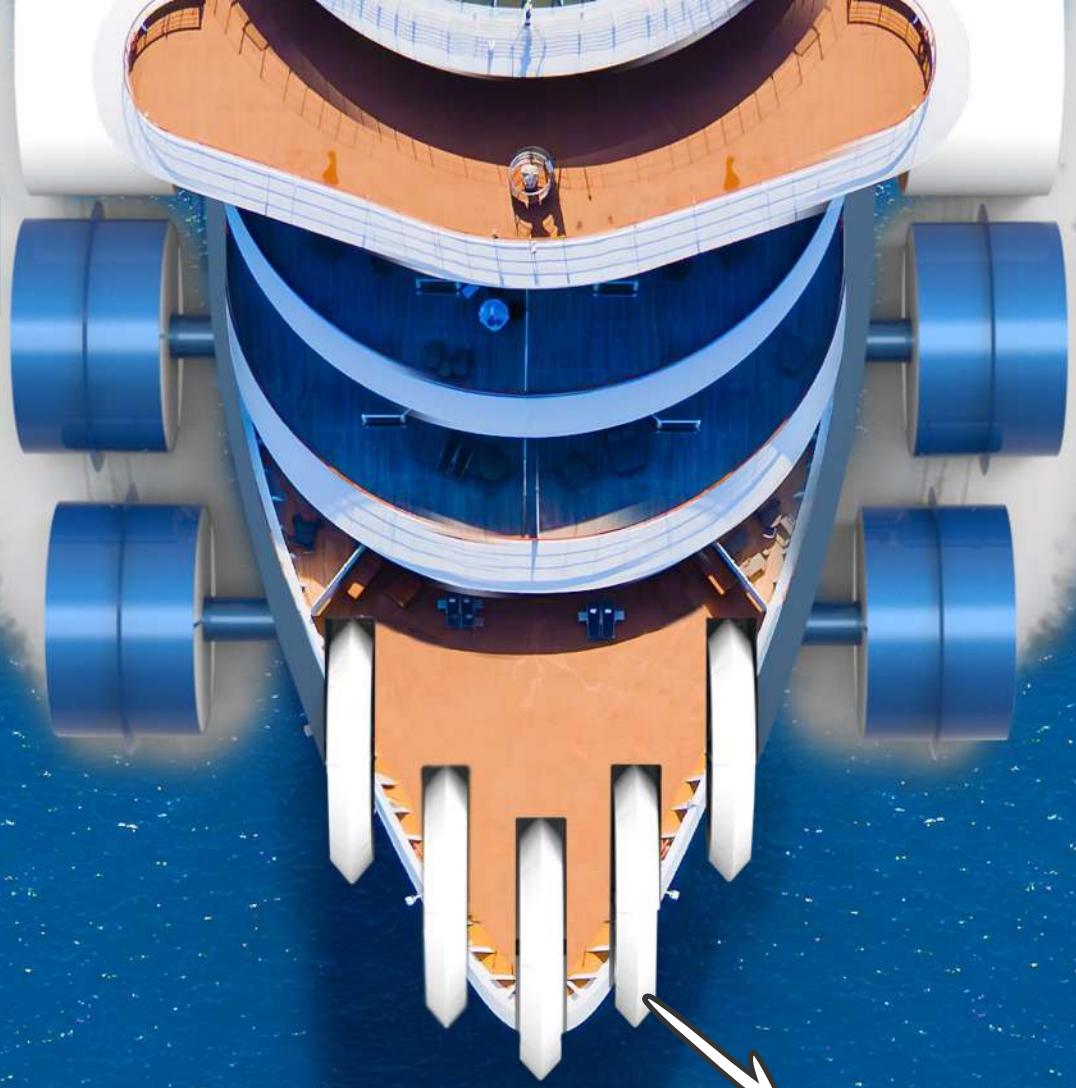
FLOTATION SYSTEMS
FOR VEHICLES ON WATER SURFACES OR SWAMPS

DESCRIPTION

"Model Ship 7 is the most complex star model of all, as it is similar to Model Ship 4, but with some additional additions to the design. As seen in the image, the ship is presented in a side view where we can see a breaker or breakwater system, guide wheels, flotation wheels, drive wheels, flotation spheres and two turbojets or turboprops."

FLOTATION SYSTEMS
FOR VEHICLES ON WATER SURFACES OR SWAMPS

BREAKWATER SYSTEM



System breakwater or breaker

The breakwater system consists of one or more breakwater wheels located at the bow of the ship, normally at **an acute angle of attack**, whose mission is to prevent the waves from reaching the ship with force, **breaking them, as the name indicates, and preventing them from hitting the ship and affecting its stability.**

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