



“Pontoon Bridge Making Vehicle”

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ABSTRACT

A pontoon bridge which is most often operated manually requires lots of man power to construct a bridge over a river or sea. The purpose of our project is to modify and design an amphibious vehicle which will be capable of running on water as well as on land in normal working condition this vehicle can be used for transportation of army troops as well as for tourism as its design makes it possible for vehicle to run under the water as well as on the land. Hence to reduce the time and human effort this modified project will be very helpful on commercial as well as on the military basics for transportation of vehicles as well as humans from one place to another with in less time and more effectively.

1.INTRODUCTION

A pontoon bridge, also known as a floating bridge, uses floats or shallow draft boats to support a continuous deck for pedestrian and vehicle travel. The buoyancy of the supports limits the maximum load they can carry. Most pontoon bridges are temporary, used in wartime and civil emergencies. Permanent floating bridges are useful for sheltered water-crossings where it is not considered economically feasible to suspend a bridge from anchored piers. Such bridges can require a section that is elevated, or can be raised or removed, to allow waterborne traffic to pass. A pontoon bridge is a collection of specialized, shallow draft boats or floats, connected together to cross a river or canal, with a track or deck attached on top. The water buoyancy supports the boats, limiting the maximum load to the total and point buoyancy of the pontoons or boats. The supporting boats or floats can be open or closed, temporary or permanent in installation, and made of rubber, metal, wood, or concrete. The decking may be temporary or permanent, and constructed out of wood, modular metal, or asphalt or concrete over a metal frame. Thus, to overcome difficulties of conventional Bridges at the time of extreme situations Pontoon Bridge making vehicle came into picture, it is quick an efficient Bridge making vehicle that can construct firm bridge very quickly.it is capable of taking heavy load of various things on it as in conventional bridges & it is constructed for temporary basics hence facilitates easy disassemble too



Fig 1.1 Pontoon Bridge Making Vehicle

2.WORKING PRINCIPLE

Pontoon Bridge Making Vehicle Works on Archimedes Principle According to which “Any fluid applies equal pressure in every direction. This pressure is the result of the weight of the fluid. When an object is partially or completely submerged in a fluid, it exerts an upward force on the object. This upward force is called the buoyant force. Due to the buoyant force, there is an apparent decrease in the weight of the object. The decreased weight is equal to the weight of the fluid, displaced by the object.”

These Pontoon Bridges are designed to meet the requirements of the location and the purpose they are meant to serve. Model can Quite often however, they serve as a temporary means of transporting vehicular and pedestrian traffic to and from ships. They can also be deployed in emergency situations or in conflict areas where transport of equipment and military personnel across water bodies is required.

Vehicle can be operated through wireless remote control for mobility & propeller produce high torque that is needed to get a thrust in forward direction while it is water , it is powered with batteries. Metallic Folds provided top side can be operated with motors that rotates in clockwise or anti clockwise direction so that it open and forms a Bridge structure and vice versa. Model is designed in such a way that capable of withstanding heavy load & reduces aerodynamic drag.

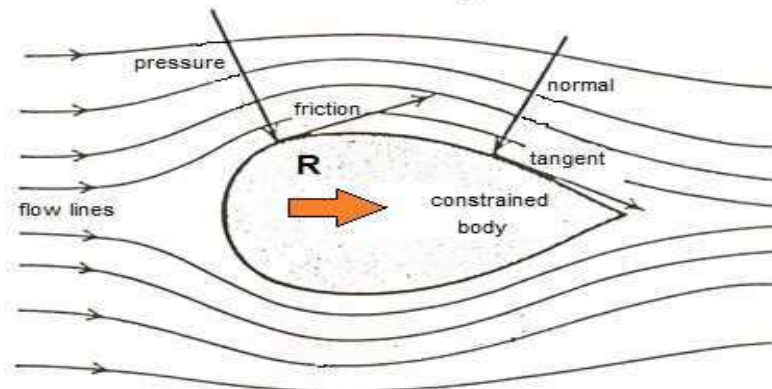


Fig 1.2 forces acting on constrained body

3.LITERATURE REVIEW

Ancient China In ancient China, the Zhou Dynasty Chinese text of the Shi Jing (Book of Odes) records that King Wen of Zhou was the first to create a pontoon bridge in the 11th century BC. However, the historian Joseph Needham has pointed out that in all likely scenarios, the temporary pontoon bridge was invented during the 9th or 8th century BC in China, as this part was perhaps a later addition to the book (considering how the book had been edited up until the Han Dynasty, 202 BC – 220 AD). Amongst other pontoon bridges designed by the Soviet Union during World War II. The PMP Floating Bridge design enables for a quick assembly of its parts. It has a carrying capacity of 60 tons.

Several impressive large-span bridges have been completed in recent years. The three most important examples to be mentioned are the Pont de Normandie in France, the Akashi Kaikyo Bridge in Japan, and the East Bridge of the Great Belt Link in Denmark. As per new innovation as in modern Bridges Our working model more often capable of replicating similar work in a better way, and wireless makes it more reliable so that it will operate even for long range with no or minimum wiring issue. Its design is finalized by studying most of the previous models as suggested in various research papers.

4.ADVANTAGES

- Man power required is less.
- Can be used in extreme climatic conditions.
- Easier to transport.
- Capable of bearing heavy load.
- Time required for assembly is less.
- Easier to apply.
- Wireless operation is possible.
- Speed can be controlled with regulation of motors.

5.CONCLUSION

The prepared model will successfully be constrained and executed to carry out the required work of opening and closing of slides to form bridge over river and to withstand load capacity in water to run on water as well as on road terrain.

Our design uses extremely simple ideas and mechanism to achieve constrained set of action However, this type of vehicles and bridges are limited by its length they are suitable to form a bridge only over short distance of 200 to 500 meters. But this type of vehicles are very useful when bridges are to constructed in a short time.

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REFERENCES

1. Erodoto (484 – 425 bC), Le storie Vol. 7, Ed. A. D. Godley, Cambridge. Harvard University Press, 1920.
2. Andrew C. E., The Lake Washington Pontoon Bridge, Civil Engineering, 9(12), 1936.
3. Gray D. L., Hutchinson B. L., A Resolution Study for Computer Modelling of Floating Bridges, Proc. Of Ocean Structural Dynamics Symposium, Pregon university, 1986.
4. Chakrabarti S. K., Handbook of Offshore Engineering, Elsevier 2005.
5. Tattoni S., Functional Refurbishment of a Pontoon Bridge, Proc. 4th Int. Conference the Conceptual Approach to Structural Design, Venezia, 27-29 giugno 2007.

