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C. S. CLIFTON

1,720,167

HYDROPLANE

Filed June 10, 1927

FIG. 1.

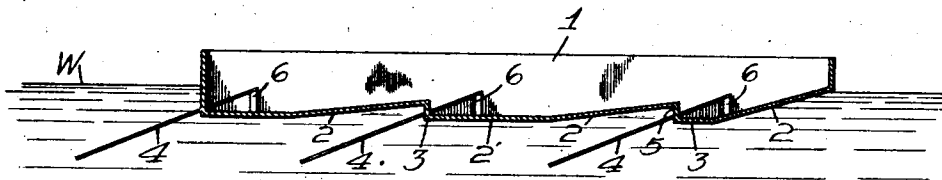


FIG. 2.

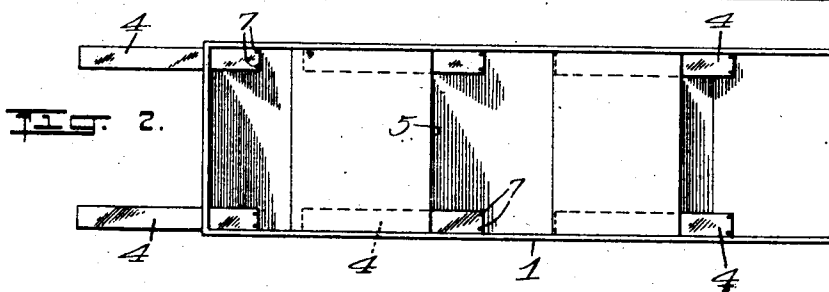


FIG. 3.

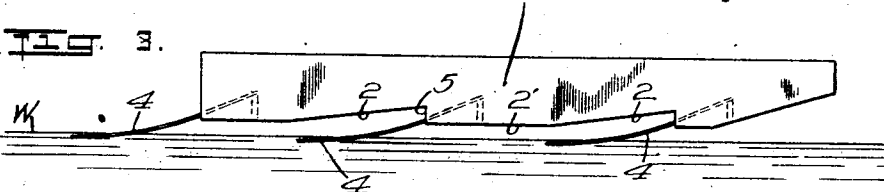


FIG. 4.

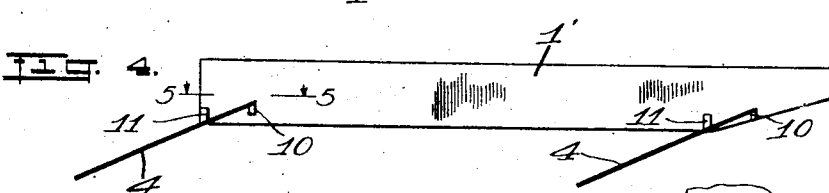


FIG. 5.

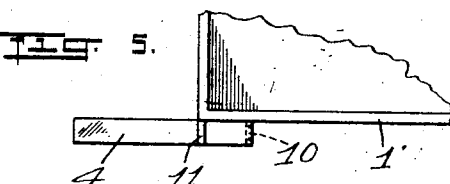
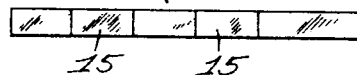


FIG. 6.



FIG. 7.



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HYDROPLANE.

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My invention relates to improvements in hydroplanes, and it consists in the combinations, constructions, and arrangements herein described and claimed.

5 An object of my invention is to provide a hydroplane of simple construction, which, when attached to a water craft of the displacement type, will lift the craft entirely out of the water when the craft is caused to run.

10 A further object is to provide a type of hydroplane which will permit the craft to which they are attached to pass over obstructions in the water, such as cakes of ice, logs, rock, etc., without damaging the craft.

15 A further object is to provide a hydroplane which will give a water craft a maximum of equilibrium when passing over rough water.

20 A further object is to provide a hydroplane which will permit a water craft to pass over rough water in such a manner as to obviate the necessity of plowing through the waves, thereby maintaining a uniform speed with a minimum of power.

25 Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

30 My invention is illustrated in the accompanying drawings, forming part of this application, in which

35 Figure 1 is a central longitudinal sectional view showing the device in its displacement position,

Figure 2 is a top plan view of the device shown in Figure 1,

40 Figure 3 is a side elevation of the device shown in Figures 1 and 2 showing the manner in which the hydroplanes lift a craft out of its displacement position when the craft is running at a high speed.

45 Figure 4 is a view showing a modified form of mounting for the hydroplanes shown in Figures 1, 2 and 3,

Figure 5 is a sectional view taken along the line 5-5 of Figure 4,

Figure 6 is a modified form of hydroplane, and

50 Figure 7 is a top plan view of the device shown in Figure 6.

55 In carrying out my invention, I make use of a water craft 1, such as that shown in Figures 1, 2 and 3. In the present instance, the craft 1 is provided with a series of inclined

surfaces 2 on the bottom 2' which is normally submerged when the craft 1 is stationary. The bottom of the craft 1 is provided with steps 3, as shown in Figures 1 and 3.

A pair of elongated inclined flexible hydroplanes 4 is projected through a face 5 of each step 3. The hydroplanes 4 are preferably of metal construction and formed flat as shown in the drawings. The inner end of each hydroplane 4 is supported within the craft by means of a bracing member 6. The hydroplanes 4 are disposed adjacent each inner side of the craft, as shown in Figure 2. The rear hydroplanes 4 project through the stern of the craft and are supported within the craft in the same manner as the other hydroplanes.

The hydroplanes 4 are firmly secured to the bracing members 6 by any suitable means, such as screws 7, and are further made secure by means of the faces 5 and the stern of the craft through which they are inserted.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. Figure 1 shows the water craft 1 in its displacement position; that is, as the craft would normally appear with respect to a water line W when the craft is stationary. The present craft may be driven by a propeller working in the water, or by a propeller working in the air. Since the method of propelling the present craft forms no part of the present invention, I have omitted the showing of any propeller.

Let us assume that the craft 1 shown in Figure 1 is caused to move forward in the water. As the speed of the craft increases, the inclined hydroplanes 4 will cause the craft to be raised out of the water, at the same time the pressure of the water against the hydroplanes 4 will cause the hydroplanes to flex slightly. When the craft has reached its proper speed, the hydroplanes 4 will have lifted the craft 1 entirely out of the water, as shown in Figure 3. While running at this latter speed, the hydroplanes 4 will be flexed and assume the position substantially as shown in Figure 3. Thus it will be seen that the craft 1 has been lifted entirely out of the water, and that the hydroplanes 4, in their flexed position, permit the entire device to glide upon the surface of the water with a minimum of wetted surface, thereby attaining a maximum of speed with a minimum

of power. The lifting power of the hydroplanes 4 will of course increase with the speed of the craft 1.

Since the hydroplanes 4 are flexible, it will now be seen that the craft 1 will pitch less when running through rough water, that is, the craft will ride upon the mean level of the water. This result is attained by reason of the fact that each hydroplane 4 will adjust itself to the surface of the water, rather than the entire craft.

When the craft 1 is propelled by an air propeller, it will be seen that the flexible hydroplanes 4 will permit the craft to pass over obstructions, such as logs, ice, or even over large frozen surfaces, such as ice or earth, without serious damage to the craft.

It will now be seen that when the hydroplanes have lifted the craft out of its displacement position, the craft will not be caused to plow through the waves, as when running through rough water, thus eliminating resistance to the speed of the craft.

In Figures 4 and 5, I have shown a modified form of mounting for the hydroplanes 4. In the latter instance, the hydroplanes are mounted on the outside of a water craft 1' by any suitable means, such as brackets 10 and 11.

Figures 6 and 7 show a modified form of hydroplane. The hydroplane H is a laminated structure consisting of a series of progressively shorter flexible members 15. The hydroplane H is flexible and may be mounted upon a water craft by any of the above mentioned methods.

It will be seen that I have provided a type of hydroplane which may be secured to various crafts other than those disclosed in the drawing, particularly sea planes. A sea plane equipped with my type of hydroplane will take off more rapidly and should the sea plane be forced to drop on land, a great deal of the shock will be absorbed by reason of the flexible hydroplanes. A sea plane thus equipped would also be capable of passing over ground, ice, etc.

I claim:

1. A device of the type described comprising a water craft, a plurality of hydroplanes projecting through the bottom of the water craft and arranged to project into the water, and means disposed within the water craft between a portion of the hydroplanes and the bottom of the water craft for rigidly supporting the hydroplanes, said hydroplanes being relatively long, flat and of a flexible character, said hydroplanes being adapted to lift the water craft out of the water when the water craft is speeding.

2. A device of the type described comprising a water craft, and a plurality of hydroplanes projecting from the water craft into the water, said hydroplanes having one end rigidly secured to the water craft and the remaining portions disposed in the water, said hydroplanes being relatively long, flat, and of a flexible character and adapted to be flexed in the direction of the longitudinal axis of the water craft for lifting the latter out of the water when the craft is speeding.

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