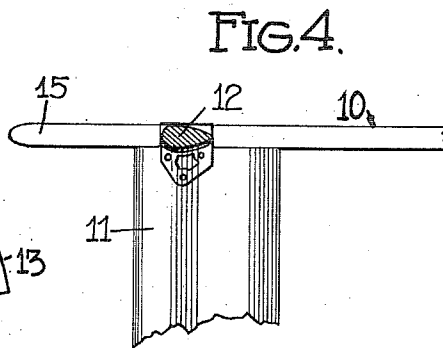
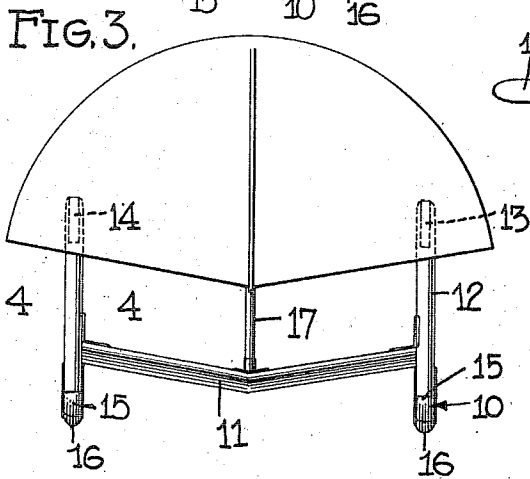
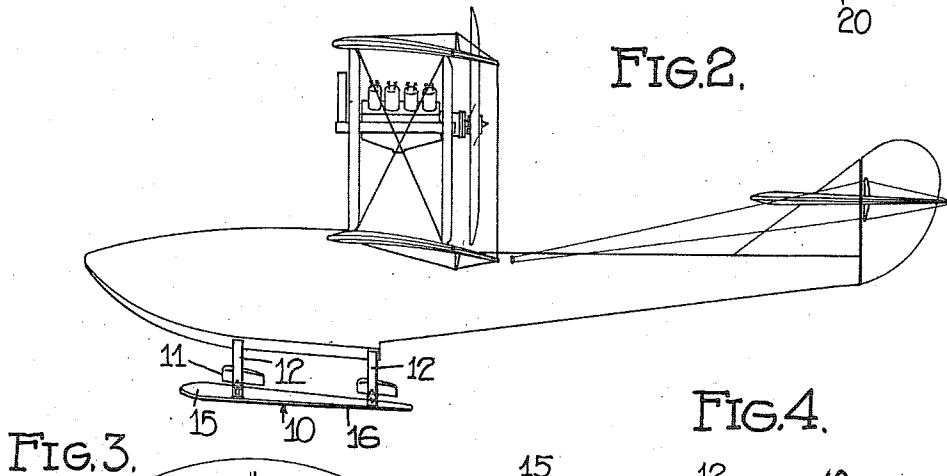
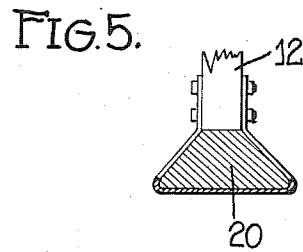
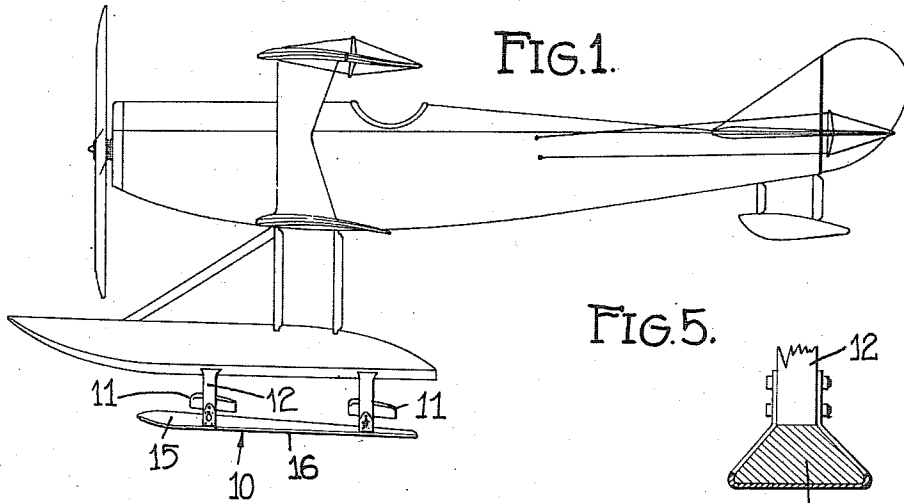


J. P. TARBOX.
 SKID STRUCTURE FOR HYDROAIRCRAFT.
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1,296,876.

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INVENTOR

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SKID STRUCTURE FOR HYDROAIRCRAFT.

1,296,876.

Specification of Letters Patent.

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Application filed March 25, 1918. Serial No. 224,689.

To all whom it may concern:

Be it known that I, JOHN P. TARBOX, a citizen of the United States, residing at Garden City, in the county of Nassau and State of New York, have invented certain new and useful Improvements in Skid Structures for Hydroaircraft, of which the following is a specification.

My invention relates to hydro-aircraft of the character disclosed in application Serial #151,502, filed Feb. 28, 1917, Glenn H. Curtiss—inventor; and is characterized by an arrangement of runners or skids beneath the lowermost hydroplaning surface or surfaces whereby in running to shore and in hauling in and putting out the hydroplanes or hydroplaning surfaces of the craft will not be damaged or permitted to come in contact with the earth.

It often happens in hydro-aircraft, that the hydroplaning surface or surfaces is or are damaged in beaching the craft as well as in launching it. Especially is this true in craft having submerged hydroplaning surfaces and in hydro-aircraft generally when attempting to beach or launch them under unfavorable weather conditions. The present invention completely eliminates this danger and effectually protects the hydroplaning surface or surfaces even though the craft be handled somewhat carelessly. Moreover, while the machine is undergoing repair, the skids, by reason of their location, constitute supports for holding it in a balanced position and on a substantially even keel.

The character of hydroplaning surface or surfaces which the skids protect may be as disclosed, *i. e.* auxiliary to the pontoon or hull bottom which is constructed in hydroplaning form, or if desired, the auxiliary hydroplaning surface or surfaces may be eliminated and the skids provided as protection for the principal hydroplaning bottom of the flotation body *per se*. Obviously in either case the relative positioning of the skids or runners may be varied within certain limits (also their size and shape) without departing from the spirit of the invention and without interfering in any way with the efficient operation of the machine. The head resistance of the skids or runners, in view of the streamline form given them, is but little.

Of the drawings:

Figure 1 is a side elevation of a hydro-aeroplane equipped with skids or runners of the character hereinafter claimed.

Fig. 2 is a side elevation of a flying boat similarly equipped.

Fig. 3 is a front end elevation (enlarged) of the skid structure showing the manner in which the skids or runners are mounted.

Fig. 4 is a horizontal section on the line 4—4 of Fig. 3, and

Fig. 5 is a front end elevation of a modified form of skid.

In Fig. 1 a skid structure designated as an entirety by the numeral 10 is shown attached to the bottom surface of the pontoon of a hydroaeroplane. In this embodiment of the invention the bottom surface of the pontoon constitutes the principal hydroplaning surface of the craft. Beneath it auxiliary hydroplaning surfaces 11 are disposed. These surfaces lie respectively fore and aft of the transverse vertical plane of the center of gravity of the machine. Each surface is of aerofoil section and convexed downwardly with the point of maximum convexity lying substantially beneath the fore and aft axis of the pontoon or in the longitudinal vertical plane of its keel line. The manner in which these surfaces function is set forth in the application above referred to of Glenn H. Curtiss. It is sufficient to state that the hydroplaning lift which these surfaces exert is auxiliary to the hydroplaning lift derived from the principal hydroplaning surface which the bottom of the pontoon itself affords.

Appropriate supports 12 depend from the pontoon to rigidly mount the auxiliary hydroplaning surfaces 11 beneath the pontoon. The upper ends of these supports are bifurcated as at 13 and extend into the pontoon for appropriate interior connection. Preferably the side keelsons of the pontoon (where side keelsons are provided) engage in the bifurcations 13 of the supports.

The supports 12 not only rigidly mount the auxiliary hydroplaning surfaces 11 but they rigidly support the skids of runners which are designated as 15. This the supports can readily do as they extend beyond the auxiliary hydroplaning surfaces, at or near their ends, and in such relation to the principal hydroplaning surface as to posi-

tion the skids 15 symmetrically at opposite sides of the keel line of the pontoon and at points extremely desirable by reason of the wide support or base which the skids thus afford.

For protection against such wear and tear as the skids are bound to receive, metal strips 16 are provided. These strips extend throughout the full length of the runners or skids to provide metal bearing surfaces. They may be removed and replaced at will.

The skids or runners are given an approximate streamline form and are preferably sufficiently elongated to interconnect and extend both forwardly and rearwardly beyond the respective pairs of supports 12. The streamline form of the skids tends to minimize resistance both in the water and in the air and their continuity fore and aft strengthens the skid structure and the auxiliary hydroplaning surfaces as well. For added strength, the auxiliary hydroplaning surfaces may be vertically braced as at 17 in the vertical plane of the keel line of the pontoon so that the braces will abut the surfaces at the points of maximum convexity.

In Fig. 2 of the drawings the construction and arrangement of the skid bars is identical with that disclosed in connection with the hydroaeroplane of Fig. 1. The auxiliary hydroplaning surfaces 11 however are somewhat differently located. Both of the surfaces, in the flying boat embodiment, are disposed in advance of the transverse vertical plane of the center of gravity rather than one in advance of and the other to the rear of this line. The location of these surfaces in certain definite relation to the center of gravity is only preferred and may be other than as disclosed. Their location as in Fig. 1 however necessitates a continuance of the skids or runners respectively fore and aft of the center of gravity and as this arrangement of the skids is such that they may effectually support the machine on an even keel, when beached, it is preferred. Moreover, if desired, the auxiliary hydroplaning surfaces 11 may be eliminated. In this event the skids or runners will offer protection to the principal hydroplaning surface formed by the bottom of the flotation body or bodies *per se*.

In the modification of Fig. 5 the skids, designated as 20 are broad and flat. This prevents them from sinking into the earth to any great extent in the event that landing or launching is made on muddy or boggy ground. Furthermore, the flat bottoms supplement the hydroplaning effect of the craft and enable it to even more quickly come to a planing position on the surface of the water.

While I have described my invention in detail in its present preferred embodiment, it will be obvious to those skilled in the art after understanding my invention, that various changes and modifications may be made therein without departing from the spirit or scope thereof. I aim in the appended claims to cover all such modifications and changes.

What is claimed is:

1. In a hydro-aircraft, a flotation body having a hydroplaning bottom surface, auxiliary hydroplanes spaced beneath the hydroplaning bottom surface, supports for the auxiliary hydroplanes continued beyond the lowermost point thereof, and skids provided at the ends of the supports to protect both the hydroplaning bottom surface and the auxiliary hydroplanes in launching and beaching the craft.

2. In a hydro-aircraft, a flotation body having a hydroplaning surface, auxiliary hydroplanes spaced beneath the hydroplaning bottom surface, the arrangement of the hydroplanes being such that one of the total number thereof lies in advance of the remaining number, separate supports for the forwardly located hydroplane and the rearwardly located hydroplane respectively, each of the several supports being continued beyond the lowermost point of the particular hydroplane with which they, the supports, are associated, and skids provided at the ends of the supports to protect both the hydroplane surface and the auxiliary hydroplanes in beaching and launching the craft, the relative location of the skids being such that the craft when supported by them is held upright and on a substantially horizontal keel.

In testimony whereof I hereunto affix my signature.

JOHN P. TARBOX.