Feb. 25, 1964 J. F. RUMSEY, JR 3,121,890

WATER SKI

Filed Sept. 1, 1961 2 Sheets-Sheet 1

Fig. 1

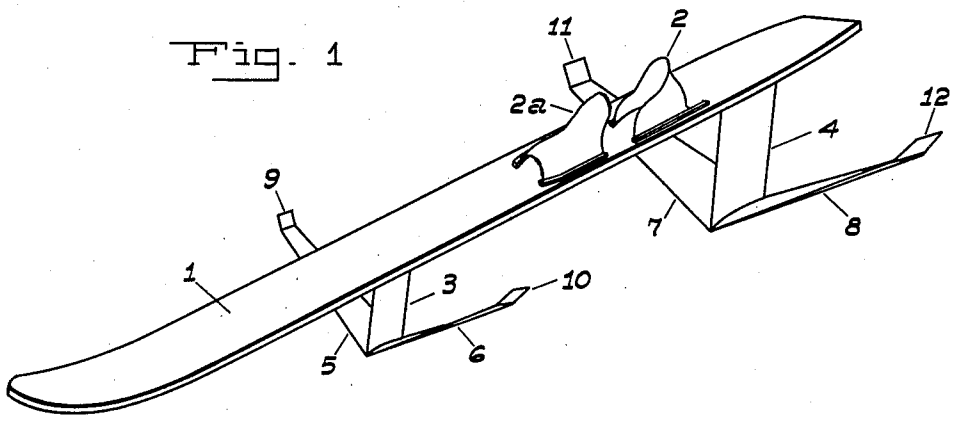



Fig. 2

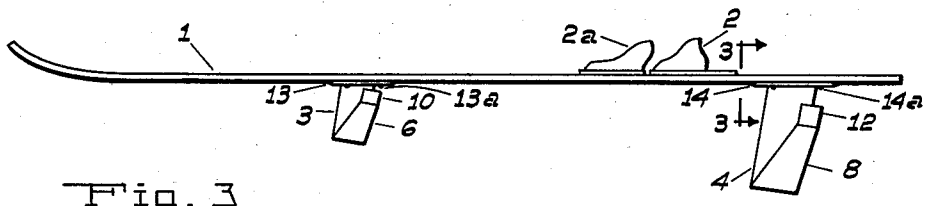



Fig. 3

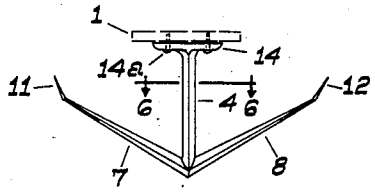



Fig. 4

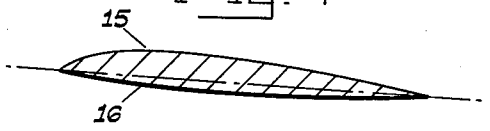



Fig. 5

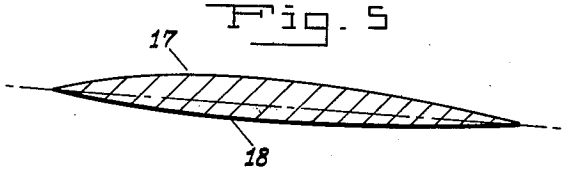
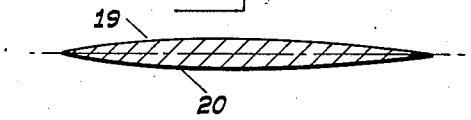



Fig. 6




Joseph F. Rumsey Jr
INVENTOR.

BY Floyd Trimble
Attorney

Feb. 25, 1964 J. F. RUMSEY, JR 3,121,890

WATER SKI

Filed Sept. 1, 1961 2 Sheets-Sheet 2

Fig. 7

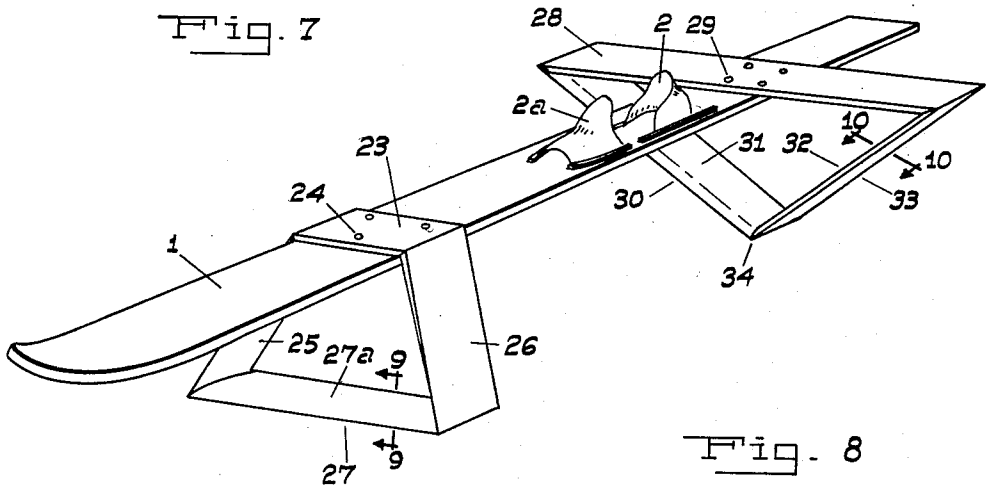



Fig. 8

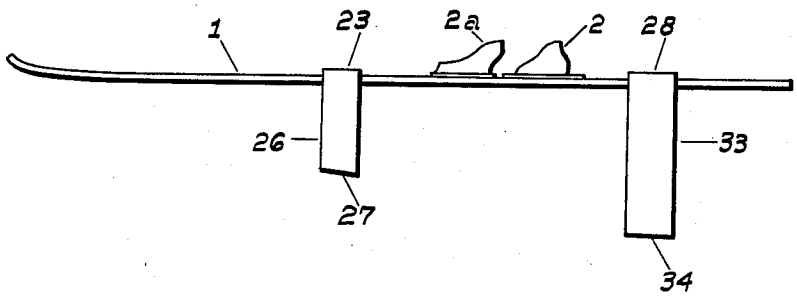



Fig. 9

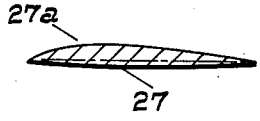
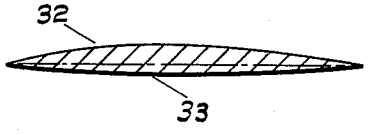



Fig. 10




Joseph F. Rumsey Jr.
INVENTOR.

BY Floyd Trimble
Attorney

United States Patent Office 3,121,890 Patented Feb. 25, 1964



3,121,890

# WATER SKI

Joseph F. Rumsey, Jr., 1708 W. Main, Oklahoma City 4, Okla.

Filed Sept. 1, 1961, Ser. No. 135,480
2 Claims. (Cl. 9—310)

This invention relates to water skis and more particularly it relates to water skis provided with front and rear hydro-foils which are positioned below the normal gliding surface of the skis.

Although water skiing wherein the motive power is provided by means of a power driven boat has attained great popularity in recent years, the results have not been entirely satisfactory. This is true because with the water skis heretofore available a rather high rate of speed must be attained before the skis will support the wearer upon the surface of the water. Another disadvantage is that presently designed water skis have considerable drag, when pulled behind a boat. The latter means that many times the skier can not attain the high speeds he desires. In other words the sport of water skiing has been limited to those having a high power motor boat for towing the skier.

It is, therefore, a primary object of the present invention to design a water ski that obviates the disadvantages of the prior art skis.

It is another object of my invention to provide a water ski that will support the wearer upon the surface of the water when moving forward at relatively low forward speeds.

It is another object of this invention to provide a water ski that presents very little drag when moving over the surface of the water.

It is another object of my invention to provide a water ski that can be constructed in a simple and economical manner.

Other objects and advantages of the present invention will become apparent as the following description proceeds.

To the accomplishment of the foregoing and related ends, said invention, then, comprises the features hereinafter fully described and particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principle of the invention may be employed.

In said annexed drawings:

FIGURE 1 is a perspective view of a water ski constructed in accordance to one embodiment of my invention;

FIGURE 2 is a side elevational view of the ski illustrated in FIGURE 1;

FIGURE 3 is a view taken along the line 3—3 and looking in the direction of the arrows of FIGURE 2;

FIGURE 4 is a cross-sectional view of front foil 6;

FIGURE 5 is a cross-sectional view of rear foil 8;

FIGURE 6 is a cross sectional view of support 4 taken along the line 6—6 and looking in the direction of the arrows of FIGURE 3;

FIGURE 7 is a perspective view of a water ski constructed in accordance to another embodiment of my invention;

FIGURE 8 is a side elevational view of the ski illustrated in FIGURE 7;

FIGURE 9 is a cross-sectional view of the front hydrofoil taken along the line and looking in the direction of the arrows 9—9 of FIGURE 7; and

FIGURE 10 is a cross-sectional view of the rear hydrofoil 32—33, taken along the line and looking in the direction of the arrows of 10—10 of FIGURE 7.



In brief the foregoing objects and advantages are attained by attaching front and rear hydro-foils to the ski. These attached foils are positioned below the normal gliding surface of the ski, the arrangement being such that the angle of incidence of the foils with respect to the ski will provide a lifting force as the foils are moved through the water.

Referring to the drawings in detail and to FIGURES 1 to 6 in particular there is illustrated a water ski constructed in accordance to one aspect of my invention wherein the numeral 1 indicates in general a conventional water ski. As illustrated item 1 is preferably a conventional water ski equipped with a conventional foot holding device 2 and 2*a* wherein 2 indicates the heel portion and 2*a* the toe holding portion of the device. Hydrofoils 5 and 6, which combine to form a central portion of the front hydro-foil assembly, are securely attached to the T-shaped member consisting of the upright 3 and cross-piece 13, which in turn is securely attached to the bottom or to the normal gliding surface of ski 1. Four screws or bolts, only two of which show, indicated by the numeral 13*a* are employed to attach cross-piece 13 to the ski. Hydro-foils 7 and 8, which combine to form a central portion of the rear hydro-foil assembly are securely attached to the T-shaped member, consisting of the upright 4 and cross-piece 14, which in turn is securely attached to the bottom or gliding surface of the ski. Four screws or bolts, only two of which show, indicated by the numeral 14*a* are employed to attach cross-piece 14 to the ski. It will of course, be understood that a greater or lesser number of screws or bolts may be used if desired. Stabilizers or end portions 9, 10, 11 and 12 are attached to the ends of the hydro-foils. It should be pointed out that the front hydro-foil assemblies as illustrated in FIGURES 1, 2, 7, and 8 are located remote from the front end of the ski and ahead of the foot holding device 2 and 2*a*. The rear hydro-foil assemblies, as shown in the same figures, is located remote from the rear of the ski and behind the foot holding device 2 and 2*a*. Also, the various hydro-foil assemblies, as shown, extend generally laterally relative to the longitudinal axis of the ski.

It will be noticed also that the planes of the hydro-foils are not parallel with the longitudinal axis of the ski but point upwardly slightly toward the toe of the ski. I have found that this design not only causes the ski to plane more quickly and at a lower speed but at higher speeds the drag or resistance to forward movement is less than would be true if the planes of the hydro-foils were parallel with longitudinal axis of the ski. When referring to the planes of the hydro-foils I mean the plane thereof which extends through the hydro-foil from its leading edge to its trailing edge, sometimes referred to in defining the angle of incidence of a foil with respect to a fixed plane or axis.

In FIGURE 4 I have illustrated a cross-sectional view of a preferred design of the front hydro-foil which is streamlined in accordance to hydrodynamic principles to produce the desired results. Likewise, in FIGURE 5 I have illustrated a cross-sectional view of the rear hydrofoil which is also streamlined. The front single foil consists of a central portion that includes two front hydrofoils 5 and 6 which are essentially mirror images of each other as is true of the two rear hydro-foils 7 and 8. The front and rear hydro-foil members, also include the connecting member 3 and connecting member 4 respectively, which serve to join the central portions to the ski. It should be understood, however, that the streamlining illustrated in FIGURES 4 and 5 is merely a preferred design. Other designs of streamlining may be used if desired or under some conditions it may be desirable not to make any attempt at all to streamline the surfaces of the hydro-foils. Connecting member 4 is preferably streamlined as indicated in the cross-sectional view illustrated in

FIGURE 6. Connecting member 3 is preferably streamlined following the same design as used for member 4.

In FIGURES 7 and 8 I have illustrated another method of attaching the hydro-foils to the ski. The front foil indicated by the numerals 27 and 27*a* is securely attached to side members 25 and 26 which in turn are attached to cross member 23. The latter is secured to ski 1 by means of screws or bolts indicated in general by the numeral 24. The rear hydro-foils (two are required which are mirror images of each other) are joined together at 34 at one end and the other end of each of the rear hydro-foils is attached securely to cross-member 28. The latter is secured to ski 1 by screws or bolts indicated in general by the numeral 29.

As is true in the case of the ski illustrated in FIGURE 1 in a preferred design of the ski shown in FIGURE 7, the hydro-foils are not parallel with the longitudinal axis of the ski but point upwardly slightly toward the toe of the ski. Under some conditions best results are obtained if the rear hydro-foil has a zero angle of incidence as compared with the normal gliding surface of the ski.

Suitable materials for the construction of the hydro-foils and the supports therefor are those which are reasonably strong, unaffected by water, light in weight and relatively economical. Specific materials that may be used include certain woods such as those used for marine purposes particularly if treated to resist water, certain plastics of which Fiberglas and nylon are examples and certain metals. Of the metals those which I have found to be particularly suitable are the light weight metals such as aluminum, aluminum alloys and magnesium.

Although I generally prefer to position the rear hydro-foil about midway between the heel of the ski and the heel 2 of the foot holding device, its exact location may be varied if desired. As to the location of the front hydro-foil that may be varied from a point which is approximately midway between the toe of the ski and the toe 2*a* of the foot holding device to a point which is closer to the toe 2*a* of the foot holding device.

While particular embidments of the invention have been described it will be understood, of course, that the invention is not limited thereto since many modifications may be made, and it is, therefore, contemplated to cover by the appended claims any such modifications as fall within the true spirit and scope of the invention.

The invention having thus been described, what is claimed and desired to be secured by Letters Patent is:

1. A water ski adapted to support a person standing thereon, including

(1) a foot retaining means mounted on the upper surface of said ski,

(2) a front hydro-foil member depending from said ski at a location remote from the front end thereof but ahead of said foot retaining means,

(3) a rear hydro-foil member depending from said ski at a location remote from the rear end thereof but behind said foot retaining means,

(4) connecting means joining said front and rear hydro-foil members to said ski,

(5) said front and rear hydro-foil members each consisting of a single foil portion including,

(*a*) a central portion joined to said connecting means and extending upwardly and outwardly therefrom,

(*b*) an end portion extending upwardly and outwardly from each end of said central portion, and wherein

(*c*) the angle of incidence of said foil portions is such that said hydro-foil members are adapted to provide a lifting force to said ski.

2. A water ski adapted to support a person standing thereon, including

(1) a foot retaining means mounted on the upper surface of said ski,

(2) a front hydro-foil member depending from said ski at a location remote from the front end thereof but ahead of said foot retaining means,

(3) a rear hydro-foil member depending from said ski at a location remote from the rear end thereof but behind said foot retaining means,

(4) said front hydro-foil member including

(*a*) a substantially horizontal foil portion, and

(*b*) connecting means comprising a pair of members wherein one of said members extends from each end of said foil portion and joins said foil portion to said ski,

(5) said rear hydro-foil member including

(*a*) a substantially horizontal connecting member secured to said ski, and

(*b*) a foil portion having an angle formed therein such that each end thereof extends upwardly and outwardly therefrom joining with said connecting member, and wherein

(6) the angle of incidence of said foil portions is such that said hydro-foil members are adapted to provide a lifting force to said ski.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 2,081,868 | Hampden | May 25, 1937 |
| 2,751,612 | Shepard | June 26, 1956 |
| 2,767,678 | Vertens | Oct. 23, 1956 |
| 2,815,518 | Kuehn | Dec. 10, 1957 |
| 2,931,332 | Hebrank | Apr. 5, 1960 |