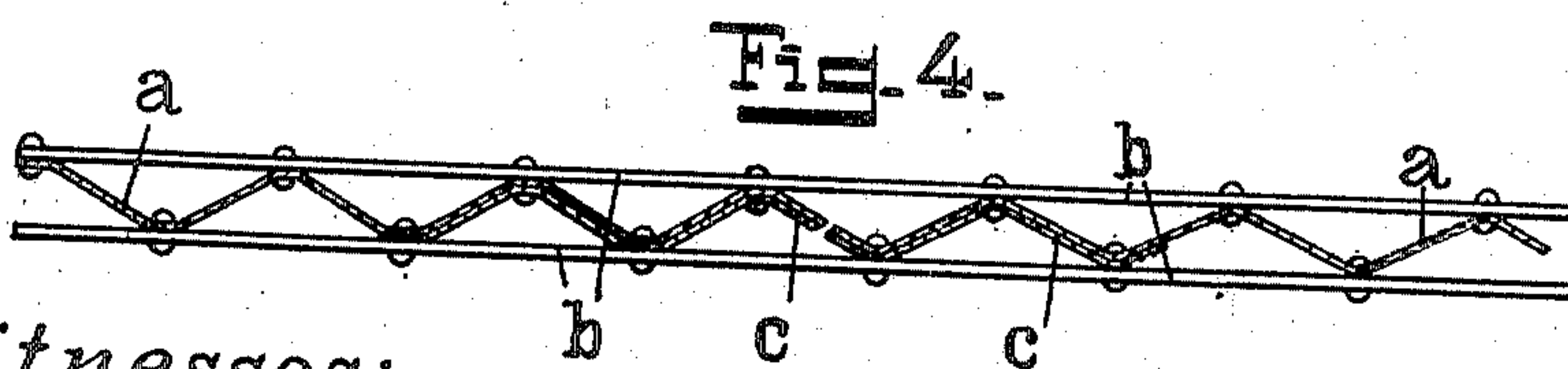
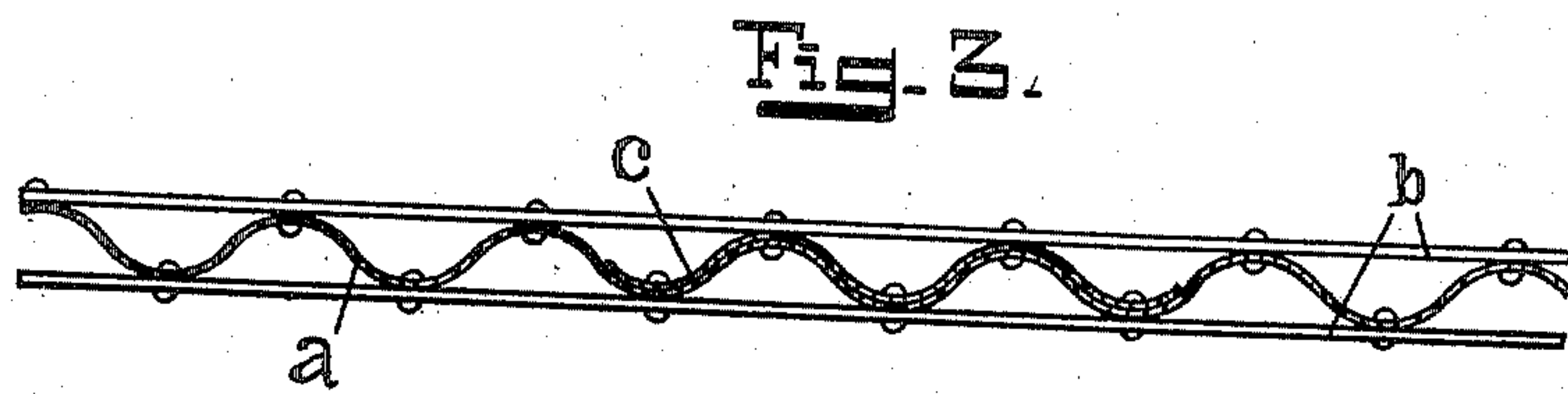
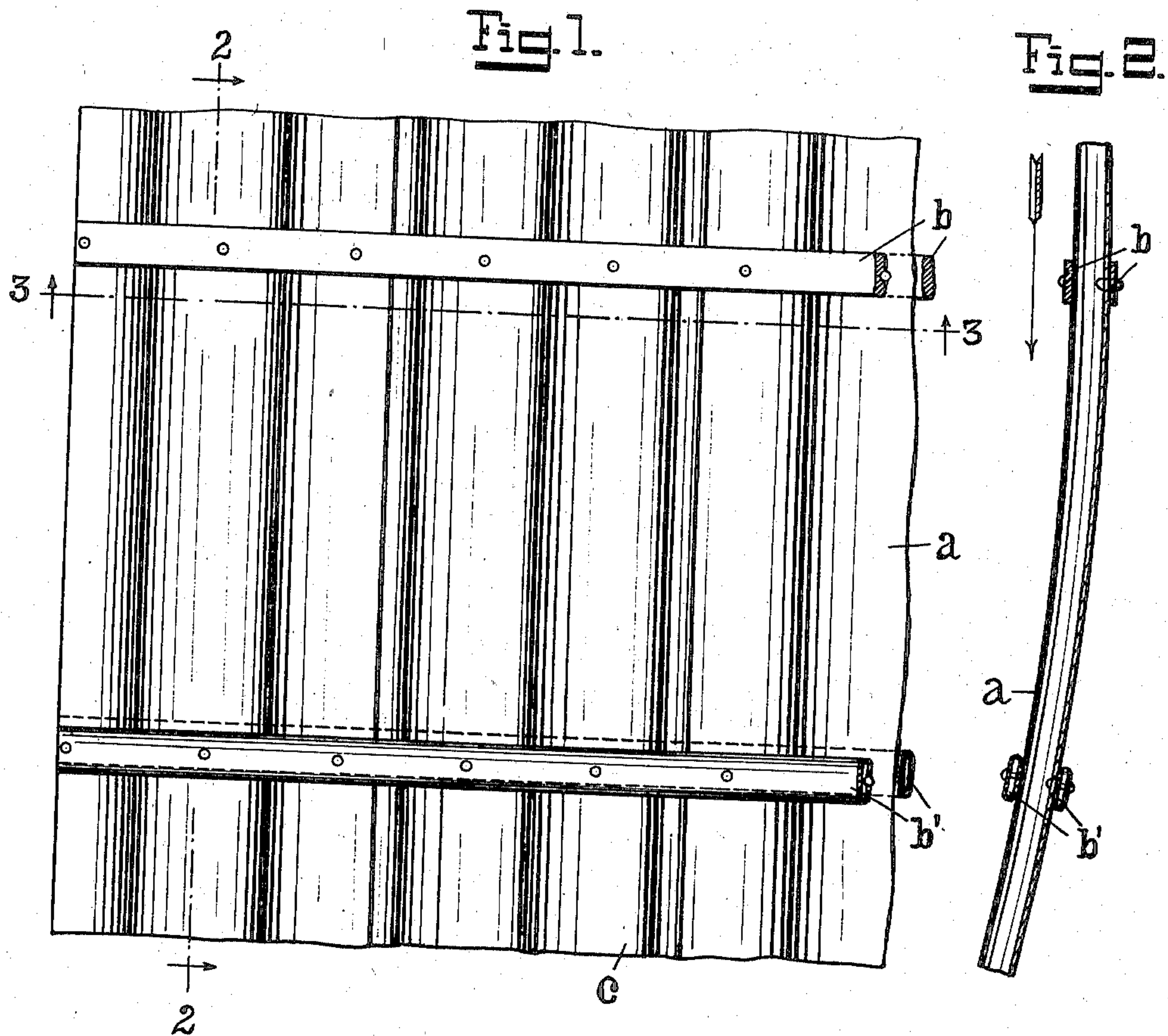


H. REISSNER.
GLIDING SURFACE FOR OPERATING IN AIR OR WATER.
APPLICATION FILED OCT. 26, 1909.

958,009.

Patented May 17, 1910.



Witnesses:

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UNITED STATES PATENT OFFICE.

HANS REISSNER, OF AIX-LA-CHAPELLE, GERMANY.

GLIDING SURFACE FOR OPERATING IN AIR OR WATER.

958,009.

Specification of Letters Patent. Patented May 17, 1910.

Application filed October 26, 1909. Serial No. 524,600.

To all whom it may concern:

Be it known that I, HANS REISSNER, doctor, engineer, and professor in the Royal Polytechnicum at Aix-la-Chapelle, Germany, a subject of the King of Prussia, residing at No. 166 Lütticherstrasse, Aix-la-Chapelle, in the Kingdom of Prussia, Empire of Germany, have invented certain new and useful Improvements in Gliding Surfaces for Operating in Air or Water; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to surfaces intended to glide in air or water, such as are employed on air-ships, or other aerial crafts such as aero-planes or kite-fliers; or on hydro-planes, rudders, propellers and so forth, and the object of my invention is to construct surfaces of the above-named kind which shall cut air or water with great ease and at the same time fulfil the conditions as to solidity, lightness, convenient manufacture and weatherproofness. Gliding surfaces of this kind were hitherto manufactured from thin boards of wood and sheet-metal for narrow planes, and from longitudinal and transverse ribs for larger planes, to which end over the frame-work of ribs a suitable fabric was stretched. Both kinds of construction, however, show the drawback either to cause a great obstruction to the current of air on account of their thickness, or on account of the ribs projecting out of the surface; or they lose their shape if made of wood, whereas their manufacture offers great difficulties when their profiles are executed in metal. Besides this the fabric employed for stretching over the framework shows great elastic and permanent deformations at the wrong place or places, causes great surface-friction, and demands an especial diagonal stiffening. All these drawbacks are avoided by the novel construction of my gliding surface which consists of a corrugated thin plate with its corrugations running in the direction of motion, and stiffening bands arranged transversely upon both sides of said plate in a manner to offer the least resistance to motion, as will be more fully explained below.

In the accompanying drawing:—Figure 1 is a plan-view of my present invention. Fig. 2 is a longitudinal sectional view taken

on line 2—2 of Fig. 1. Fig. 3 is a cross-sectional view taken on line 3—3 of Fig. 1. Fig. 4 shows different shapes of corrugations of the corrugated plate.

In putting my invention into practice a corrugated very thin plate *a*, the corrugations of which run parallel to each other in the direction of motion indicated by the arrow in Fig. 2, is provided with the necessary transversal ribs by securing in any suitable manner on both sides of said corrugated plate on top of the undulations flat bands *b* or flat tubes *b'*. In doing so any two bands and the corrugations lying between them form a girder capable of withstanding traction, compression, bending and buckling. A gliding surface thus constructed will offer but very little resistance in the direction of motion, and the flat bands or flat tubes themselves act as gliding and bearing surfaces. The diagonal stiffening necessary between two adjacent transversal bands *b* or flat tubes *b'* is accomplished by the corrugated plate itself. A girder of this construction can either serve as principal rib of a monoplane capable of resisting any bending moments, or as a compression or traction chord of the girder of a biplane or of a multiplane. In case the corrugations lying between adjacent bands or tubes and forming the lacing of this girder should be too weak to resist the shearing forces of the girder, a reinforcement can be effected by employing a corrugated reinforcing strip *c* as indicated in Figs. 1 and 3.

The corrugation may be undulated, as shown in Fig. 2, or triangular as indicated in several ways in Fig. 4. Besides this the corrugated plate might be made of transparent material in order to make it difficult to detect the sliding surface from afar. The flattened tube *b'* might be employed for the circulation of the water employed for cooling the motor. The corrugations perform at the same time the function of stabilizing and steering around the vertical axis.

I claim:—

1. A gliding surface for operating in air or water consisting of a corrugated thin plate with its corrugations running in the direction of motion, and stiffening bands arranged transversely upon both sides of said plate in a manner to offer the least resistance to motion.

2. A gliding surface for operating in air

or water consisting of a comparatively thin corrugated metal plate with its corrugations running in the direction of motion, and flat stiffening bands arranged upon both sides
5 of said plate transversely to said corrugations in a manner to offer the least resistance to motion.

3. A gliding surface for operating in air or water consisting of a very thin corrugated plate with its corrugations running in
10 the direction of motion and stiffening bands composed of flat tubes and arranged upon both sides of said plate transversely to said corrugations in a manner to offer the least
15 resistance to motion.

4. A gliding surface for operating in air or water consisting of a very thin corrugated plate with its corrugations running in the direction of motion, a reinforcing strip, and stiffening bands arranged upon both
20 sides of said plate opposite each other and transversely to said corrugations in a manner to offer the least resistance to motion.

In testimony whereof I have signed my name to this specification in the presence of
25 two subscribing witnesses.

HANS REISSNER.

Witnesses:

HENRY QUADFLIEG,
HUGO HOROWITZ.