

H. SCHNEIDER & T. KURRELL.

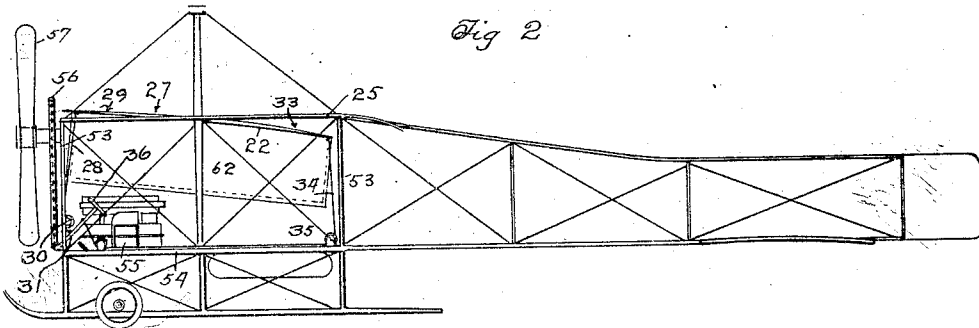
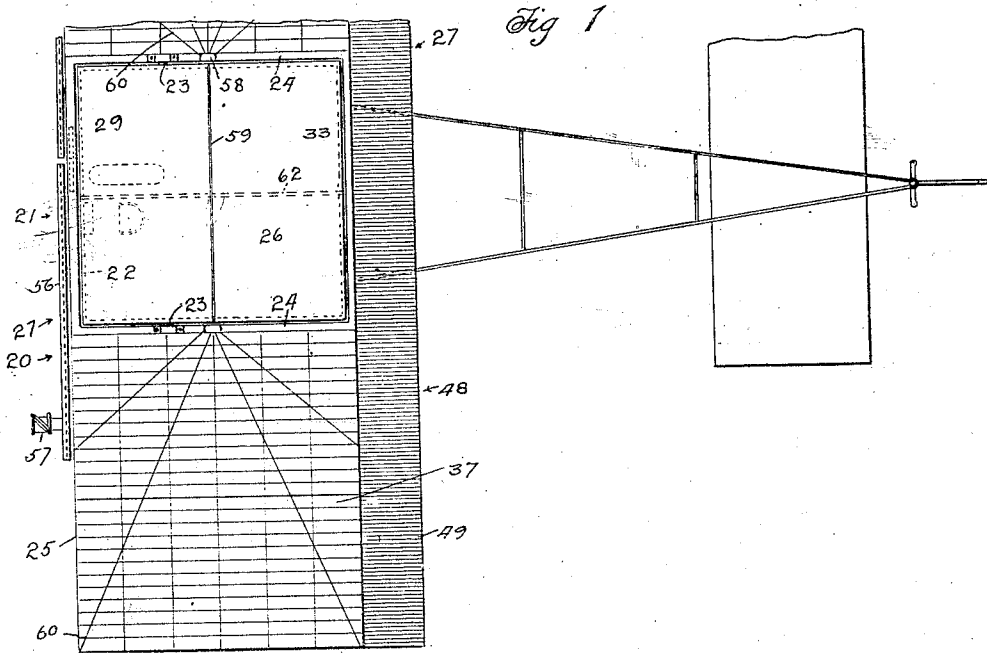
AERIAL NAVIGATION.

APPLICATION FILED MAY 4, 1912.

Patented Mar. 4, 1913.

2 SHEETS—SHEET 1.

1,054,989.



Witnesses
Harry A. Brooks

J. A. Mansfield

Inventors

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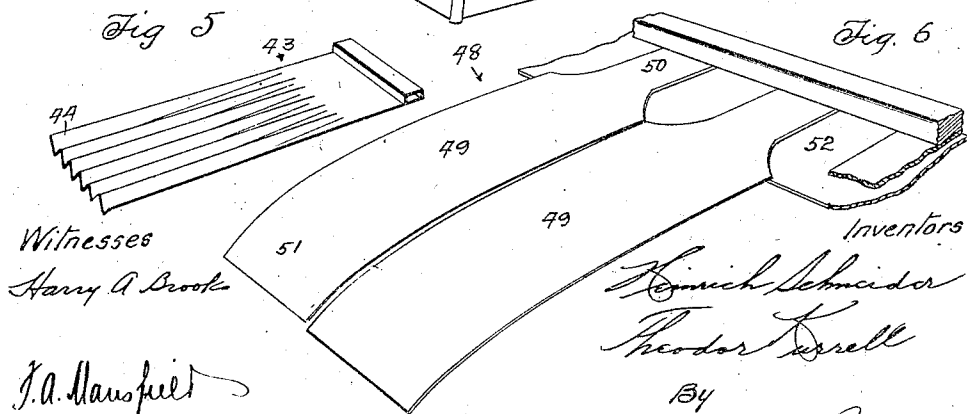
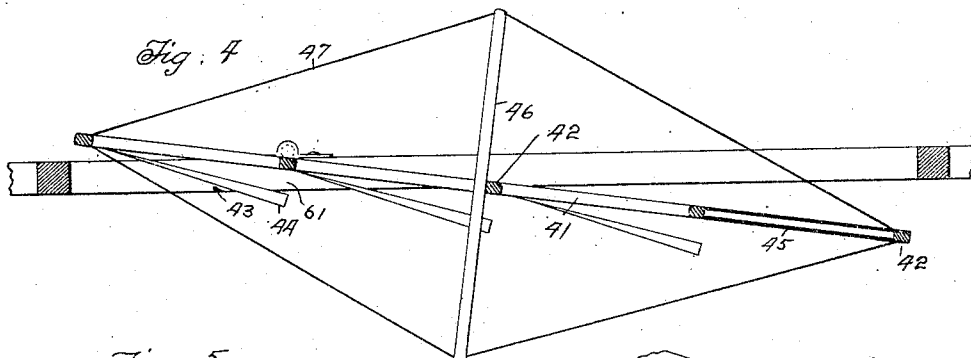
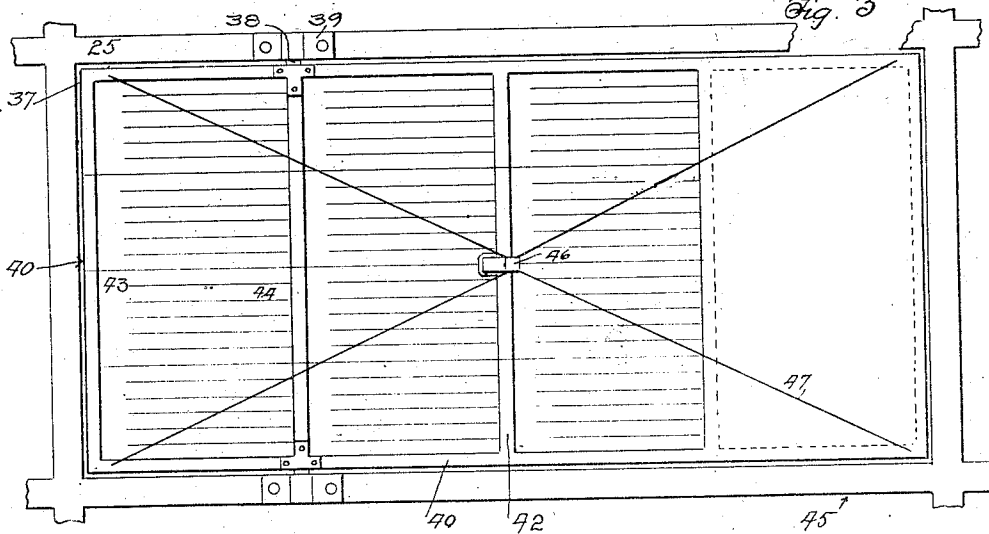
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UNITED STATES PATENT OFFICE.

HEINRICH SCHNEIDER AND THEODOR KURRELL, OF LOS ANGELES, CALIFORNIA.

AERIAL NAVIGATION.

1,054,989.

Specification of Letters Patent.

Patented Mar. 4, 1913.

Application filed May 4, 1912. Serial No. 695,294.

To all whom it may concern:

Be it known that we, HEINRICH SCHNEIDER, a subject of the Emperor of Austria-Hungary, and THEODOR KURRELL, a subject of the Emperor of Germany, both residing at Los Angeles, in the county of Los Angeles, State of California, have invented certain new and useful Improvements in Aerial Navigation; and we 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.

This invention relates to aerial navigation and more particularly to means for raising, sustaining and equilibrating heavier than air machines.

One of the objects of the invention is to provide means for the purpose specified that shall be automatic in action.

A second object is to provide such means that will automatically vary their angle of advance as the speed of the machine to which they pertain increases or decreases.

A third object is to provide such means as will utilize the upward undulations of atmospheric waves for lifting and sustaining purposes and yet be unaffected by the downward movement of the said waves.

Other objects and the advantages of the invention will be apparent to those skilled in the art to which it appertains from a consideration of one form of apparatus in which the invention may be embodied, taken in connection with the accompanying drawings in which;

Figure 1 is a plan view of a heavier than air flying machine having the invention incorporated therein. Fig. 2 is a side elevation of the same. Fig. 3 is a plan view of one of the elements and its appurtenances included in the sustaining means; Fig. 4 is a side elevation thereof; Fig. 5 is a perspective view of one of the valves carried by said element, and Fig. 6 is a similar detail of a portion of the rearward part of the said sustaining means.

Referring now more particularly to Figs.

1 and 2, the supporting means 20 may consist of the central part 21 consisting preferably of a sub-frame 22—mounted by means of pivots 23 between fore and aft pieces 24 of the frame 25. Upon sub-frame 22 may be stretched suitable material 26 by which means an elevator 27 is formed. The inclination of this elevator 27 may be controlled by means of cables 28 attached to its forward part 29 and passing over pulley 30 to steering post 31, and cable 34 attached to its rear part 33 passing over pulley 35 to the steering post 31. Thus a forward movement of the steering wheel 36 will raise the front edge of elevator 27 and a rearward movement of the wheel will depress the front edge thereof.

At each side of elevator 27 the frame 25 is constructed to provide a plurality of rectangular spaces 37 within each of which (see Figs. 3 and 4) is mounted by means of trunnions 38 held in bearings 39, an element 40, not shown in Figs. 1 and 2. The frame of each element may consist of side bars 41 and transverse bars 42. To the forward three of the transverse bars 42 are attached the front ends of valves 43 (see Fig. 5) formed of thin spring metal or other suitable material, their rear ends extending under the succeeding transverse bar. The front parts of valves 43 are preferably flat and flexible but their rear parts are desirably stiffened by corrugations 44 or other suitable means as shown in Fig. 5.

Between the two rearmost bars 42 and over the rear ends of side bars 41 may be stretched fabric or other material forming a part 45 the surfaces of which are impervious to air. The elements 40 may be held from distortion by means of king-post 46 mounted upon the central bar 42 and connected by means of stays 47 to points at or near the corners of element 40.

To the rearward edge of frame 25 may be attached an extension 48 (see Fig. 6) preferably consisting of a plurality of strips 49 of elastic sheet metal each desirably having its front portion 50 narrowed to pro-

vide greater flexibility at that point. The rear parts 51 of the strips 49 may normally be held in a downwardly curved position by the portions 50. A narrow piece 52 of

5 leather or fabric may be positioned beneath the front ends of the strips 49 to close the spaces between the portions 50 of the strips.

By means of uprights 53, frame 25 may be connected to lower frame 54 upon which
10 may be supported a motor 55 which by means of chains 56 drives propellers 57, only one of which is shown.

Frame 25 may be stiffened by means of king posts 58 connected to each other by
15 the rod 59 and to the frame by stays 60. A central vertical longitudinal fin 62 may, if desired, be attached at the lower side of elevator 27 to assist in maintaining lateral stability.

20 The frames 25 and 54 may have attached thereto the usual accessories and appurtenances necessary to aerial navigation which are not here described in detail as they form no part of the present invention.

25 The mode of operation of this invention may be as follows: Upon motor 55 being put in operation the propellers 57 draw the apparatus forward. The parts 45 striking the air cause the elements 40 to assume a nearly horizontal position. When
30 the speed becomes sufficient, the air reacting against the sloping under side of the valves 43 lifts the machine, to which the invention is applied, from the ground. As
35 the speed increases, the air pressure causes the valves 43 to become nearly closed. Should there be, as is generally the case, undulations of the air, caused by the advance
40 of the machine, or otherwise, the ascending components of the undulations will impinge upon the lower surfaces of valves 43 and tend to raise the apparatus while the downward components will pass through the
45 spaces 61 between the rear ends of the valves and transverse bars 42.

The altitude at which the machine flies may be governed by means of elevator 27 whose method of control has already been explained.

50 We claim:

1. In supporting means for air vehicles, the combination of a plurality of elements free to oscillate upon axes transverse to the direction of flight, transverse bars upon
55 elements, and valves having the forward end portion thereof flexible and mounted fast upon the bars, said valves normally yieldingly held in open position and extending rearwardly beyond and below the front
60 end of the adjacent bars.

2. In supporting means for air vehicles, the combination of a frame, a plurality of elements pivotally mounted upon said frame, a plurality of valves carried by said

elements, each of said valves provided with 65 a plurality of corrugations extending from its rear toward its front.

3. In means for aerial navigation, the combination of a frame, elements free to oscillate on the frame upon axes transverse 70 to the direction of flight and including transverse bars, and valves having the forward end portion thereof flexible and mounted fast on the forward of the bars and having their rearward portions non- 75 flexible and extending below the bars at the rear of said forward of the bars.

4. In supporting means for air vehicles, the combination of a frame, a series of air actuated elements pivotally mounted there- 80 upon, valves carried by said elements, means providing an elevating surface pivotally mounted between said elements and controlled by the operator, and a rearward extension for the first means comprising a 85 plurality of blades normally yieldingly held in a downwardly and rearwardly curved position, substantially as and for the purposes set forth.

5. In means for aerial navigation, the 90 combination of a frame, an elevator positioned substantially centrally of the frame and pivotally mounted between fore and aft pieces of said frame, a plurality of elements arranged free to oscillate on the 95 frame at each side of the elevator, and valves having the forward end portion thereof flexible and affixed fast on the elements, said valves normally yieldingly held in open position. 100

6. In means for aerial navigation, the combination of a frame, a plurality of elements free to oscillate on the frame upon an axis transverse to the direction of flight, said elements having thereon parts imper- 105 vious to air and having valves normally yieldingly held in an open position, said valves having the forward end portion thereof made flexible and secured fast to the elements. 110

7. In means for aerial navigation, the combination of a frame, a plurality of elements free to oscillate on the frame upon an axis transverse to the direction of flight, said elements having thereon parts imper- 115 vious to air and having valves normally yieldingly held in open position, and an extension on the rear end of said frame, consisting of a plurality of flexible strips having the rear portion thereof normally held 120 in a downwardly curved position.

8. In means for aerial navigation, the combination of a frame, an elevator positioned substantially centrally of the frame and pivotally mounted between fore and 125 aft pieces of said frame, a plurality of elements arranged free to oscillate on the frame at each side of the elevator,

valves normally yieldingly held in open position carried by said elements, and an extension on the rear end of said frame, consisting of a plurality of flexible strips
5 having the rear portion thereof normally held in a downwardly curved position, substantially as described.

In testimony whereof, we have signed our names to this specification in the presence

of two subscribing witnesses at Los Angeles 10 county of Los Angeles, State of California, this 27th day of April A. D. 1912.

HEINRICH SCHNEIDER.
THEODOR KURRELL.

Witnesses:

A. H. LIDDERS,
HARRY A. BROOKS.