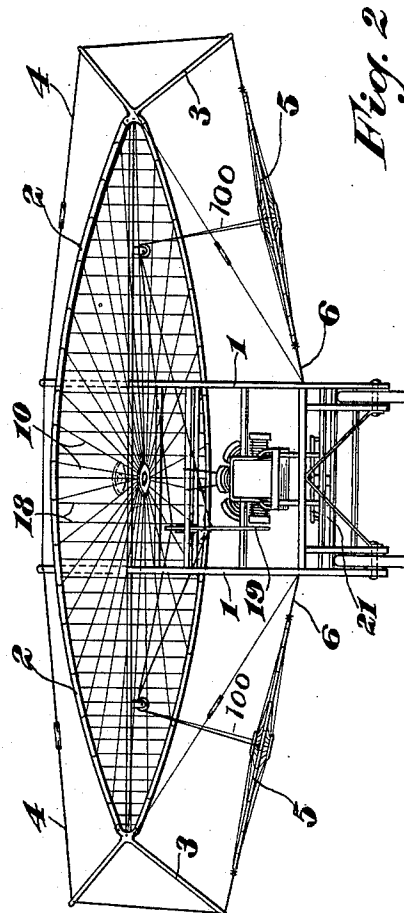
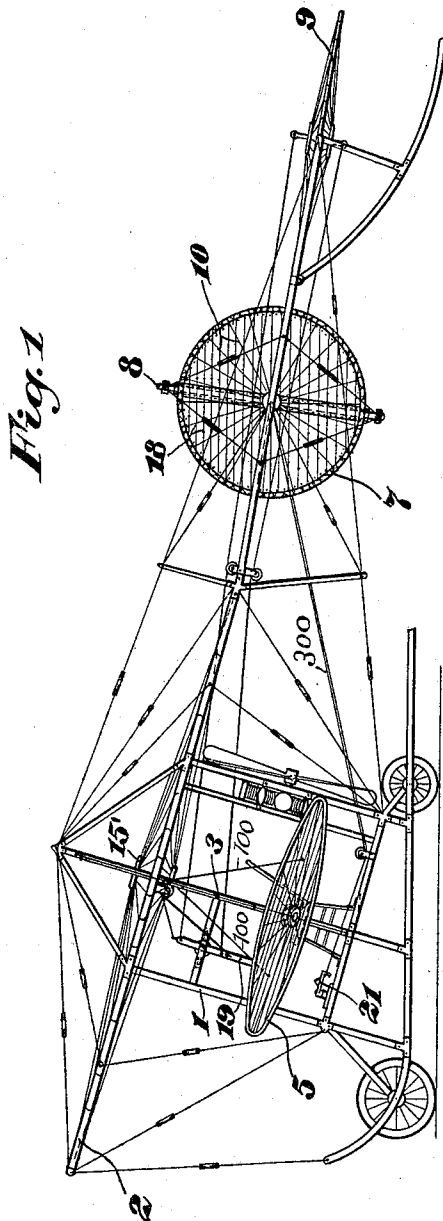


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AEROPLANE.
APPLICATION FILED MAR. 11, 1911.

1,029,754.

Patented June 18, 1912.

3 SHEETS—SHEET 1.



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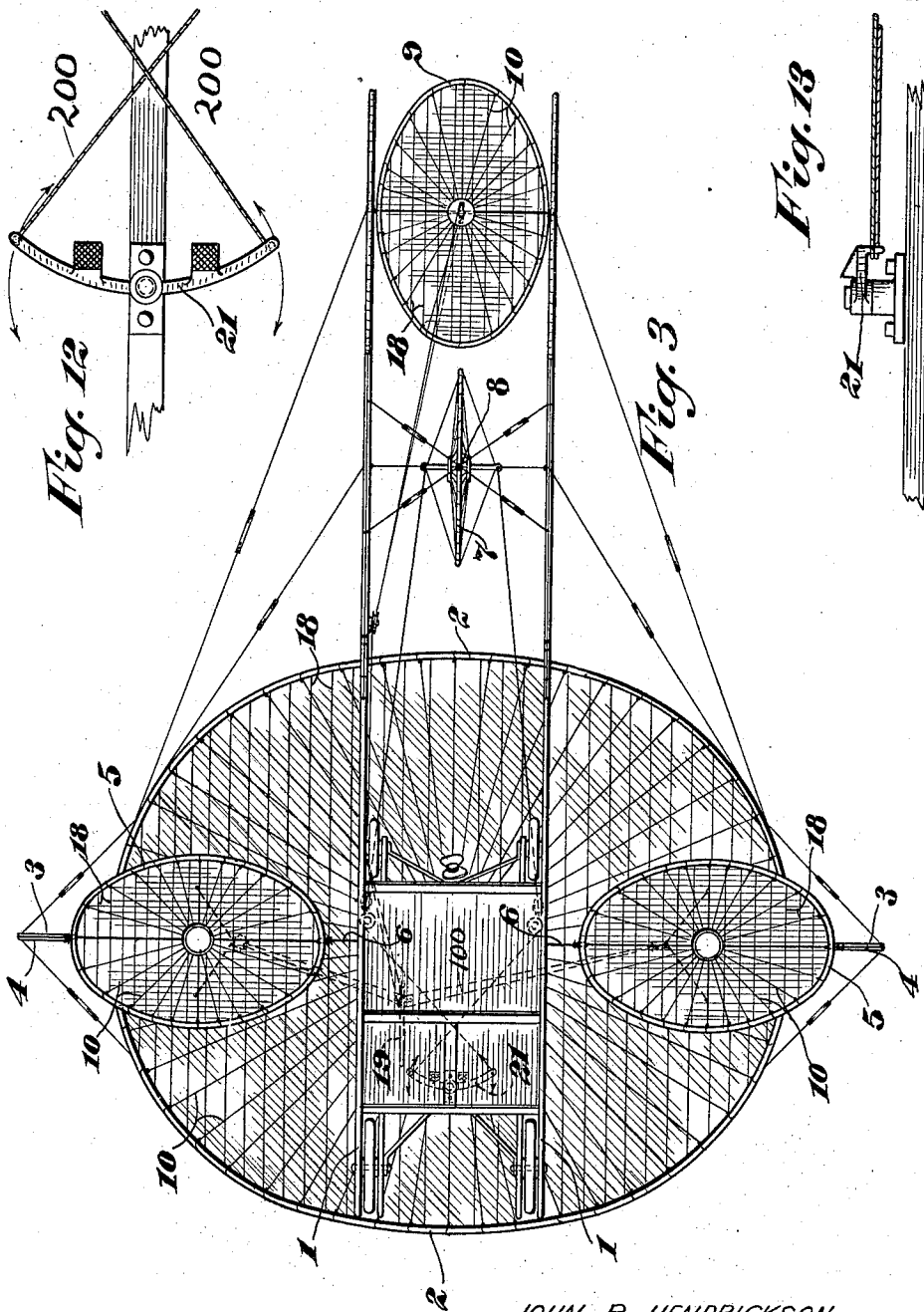
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3 SHEETS—SHEET 2.



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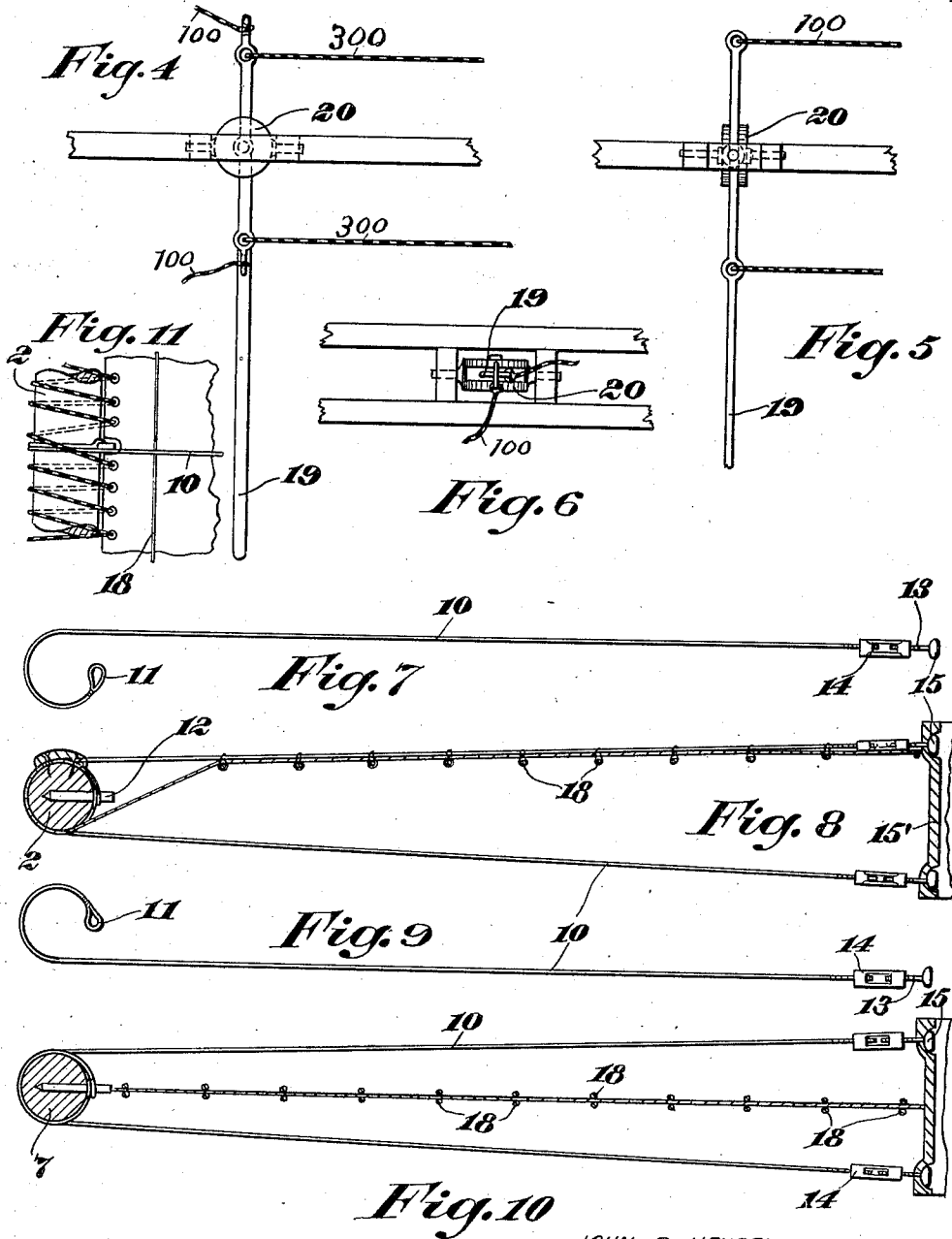
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3 SHEETS-SHEET 3.



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UNITED STATES PATENT OFFICE.

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AEROPLANE.

1,029,754.

Specification of Letters Patent.

Patented June 18, 1912.

Application filed March 11, 1911. Serial No. 613,763.

To all whom it may concern:

Be it known that I, JOHN R. HENDRICKSON, a subject of the King of England, residing at Edmonton, in the Province of Alberta, Canada, have invented certain new and useful Improvements in Aeroplanes; and I do hereby declare that the following is 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.

The invention to be hereinafter described relates to aeroplanes and more particularly to monoplanes.

In order to more clearly disclose the construction, operation, and use of the invention, reference should be had to the accompanying drawings forming part of the present application.

Throughout the several figures of the drawings like reference characters designate the same parts.

In the drawings: Figure 1 is a side elevation of the invention complete; Fig. 2 is a front view of the same; Fig. 3 is a bottom plan view of the same; Fig. 4 is an enlarged detail side elevation of the lever and connections for operating the elevating and balancing planes; Fig. 5 is an end view of Fig. 4; Fig. 6 is a plan view of the same; Fig. 7 is a side elevation of one of the wire spokes of the main plane; Fig. 8 is a vertical cross section through one half of this main plane; Fig. 9 is a view similar to Fig. 7 showing one of the wire spokes; Fig. 10 is a view similar to Fig. 8, showing a section of the steering plane; Fig. 11 is an enlarged fragmentary view showing the manner of binding the sustaining material to the rim of the steering plane; Fig. 12 is a plan view of the foot lever for operating the steering wheel; and Fig. 13 is an end view of the same.

Referring to the drawings in detail, 1 indicates a strong skeleton frame on which is rigidly and immovably mounted a large, stationary, sustaining plane 2 provided with strong guide brackets 3 rigidly secured at its opposite ends. About these brackets and the upwardly projecting ends of the frame members is stretched a strong supporting cable 4 provided with turn buckles or similar tightening devices. The opposite ends of this cable are connected to the rims of small balancing planes 5 which are arranged below and partly beyond the outer rim of

the plane 2. At points diametrically opposite to such connections, are secured the ends of short connecting cables 6 by which these balancing planes are coupled to frame 1. Thus the planes 5 are both flexibly and pivotally connected to the frame 1 in slightly inclined positions at the sides of the frame.

Between two rearwardly extending parallel frame members is suspended a vertical steering plane or rudder 7. The support for this plane comprises a rod 8 passed diametrically through the plane and journaled to turn freely therein. To the opposite ends of this shaft are secured a plurality of supporting guy wires which extend from the frame members. Each of the wires is provided with a turn buckle or other suitable tightening device. To the rear of this vertical plane is mounted a horizontal elevating plane 9. The mounting for this elevating plane, as in the case of plane 7, is a rod passed diametrically through its frame and having its ends mounted in the parallel extended frame members.

From the above, it will be clear that the balancing planes, steering plane, and elevating plane, are all free to turn about their diametrical axes.

As previously described, each balancing plane may be supported by cables connected to the rim of the plane at diametrically opposite points. However, the preferred manner of support is somewhat similar to that of supporting the elevating plane—i. e., a bar is passed diametrically through each plane and the cables are secured to the ends of the bar. This takes the pulling strain of the cables off of the frame of the plane.

It will be noticed that each of the planes is constructed somewhat on the principle of a bicycle wheel—with a central hub, a rim, and a plurality of wire spokes connecting the hub and rim. However, the spokes are arranged in two sets, separated at one end by the distance of the thickness of the rim, and similarly separated at the other end by the distance of the length of a hub. Between these sets of spokes is secured the fabric of the plane, as will later appear. Each spoke 10 is threaded at one end and provided with a loop 11 at its opposite end. Each loop 11 is adapted to be slipped over a cooperating pin 12 projecting inwardly from the rim. The threaded inner end of each spoke is adjustably connected to a similarly threaded pin 13, by a turn buckle 14. Each

pin 13 is provided with a head 15 adapted to be seated in a recess or cavity in the wall of hub 16 and surrounding a small perforation through which the pin projects.

5 In the sustaining, balancing, and elevating planes, the fabric is wound once about the rim and held in place by a bead or clip 17 securely nailed through the fabric and into the rim. This fabric is then pressed
10 upwardly against the top series of spokes and held in position thereagainst by a plurality of stretching or tightening wires 18 which press against the spokes from below and are connected, at their opposite ends, to
15 the rim. In the case of the vertical steering plane, the only difference is in the supporting of the fabric. In this plane the edge of the fabric is secured to the rim in the usual manner. However, since the strain on either
20 face is equal, when in use, the fabric is supported midway between the spokes, by means of two parallel sets of wires 18, one set on each side of the fabric.

One particular feature of the invention is
25 the special combination steering lever for the balancing and elevating planes. A single lever with two distinct sets of movements, is provided. This comprises a single hand lever 19 fulcrumed on a pin extending
30 through a block 20. The block 20 is journaled in the frame work to turn or swing at right angles to the movement of the lever about its fulcrum. The block, of course, carries the lever with it. The result is that the
35 lever has a back and forward or front and rear swinging movement about its fulcrum, and a side to side lateral swinging movement with the block 20, substantially at right angles to the first mentioned movement.
40 The lever is mounted in the frame work of the machine above and slightly in front of the operator's seat and at a point about midway between the balancing planes. The connecting cords 100 from these balancing
45 planes are led in laterally over suitable guide rollers, the corresponding cord of each plane being secured to the lever at one or the other side of its fulcrum, respectively, as the case may be. The opposite ends of
50 these cords are secured to the balancing planes at points diametrically opposite, of course. At approximately the same points on the lever, are secured the ends of the cords 300 for adjusting the elevating plane.
55 On referring to Figs. 1, 2, 4, 5, and 6, it will be evident that a front to rear movement of lever 19 will effect operation of the elevating plane 9, without effecting any movement of the balancing planes 5. Likewise, a
60 side to side movement of the lever 19 will effect operation of the balancing planes 5

without effecting operation of the elevating plane 9. Thus, a single simple lever may be used for operating both the balancing planes and the elevating plane.

65 Directly in front of the operator's seat is fulcrumed a curved foot bar or foot lever 21. To the opposite ends of this foot lever 21 are secured the controlling cables 200 of the steering plane 7. These cords are passed
70 forwardly from the opposite ends of a pin 22, over suitable guide pulleys, and crossed, their ends being then connected to the opposite ends of the foot lever 21, as above stated.

75 It is thought that the operation and use of the invention will be clear from the preceding detailed description.

Changes may be made in the construction, arrangement, and disposition of the several parts of the invention without in any way
80 departing from the field and scope of the same, and it is meant to include all such within this application wherein only a preferred form has been disclosed.

Having thus fully described my invention,
85 tion, what I claim as new and desire to secure by Letters Patent is:

1. In combination, a frame work provided with upwardly extending projections at its forward end, a main sustaining plane rigidly
90 secured therein, brackets extending therefrom, a supporting cable extending about said projections and said brackets, and inclined balancing planes pivotally supported by said cables at points below said
95 main sustaining plane.

2. In combination, a frame work provided with upwardly extending projections, a main sustaining plane rigidly mounted in said frame, brackets extending from said
100 plane, a supporting cable passed about said projections and brackets and about said main plane, inclined balancing planes arranged below said main plane and pivotally supported at one side by the ends of said
105 cable, and means for pivotally connecting the other sides of said balancing planes to the frame.

3. An aeroplane plane comprising a hub, a rim, a plurality of spokes arranged in two
110 sets spaced apart by said hub and rim and connecting the same, means for adjusting each individual spoke, a fabric arranged between said sets of spokes, and tightening wires adapted to hold said fabric in place.
115

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JOHN R. HENDRICKSON.

Witnesses:

FLORA MACDONALD,
C. HENDRICKSON.