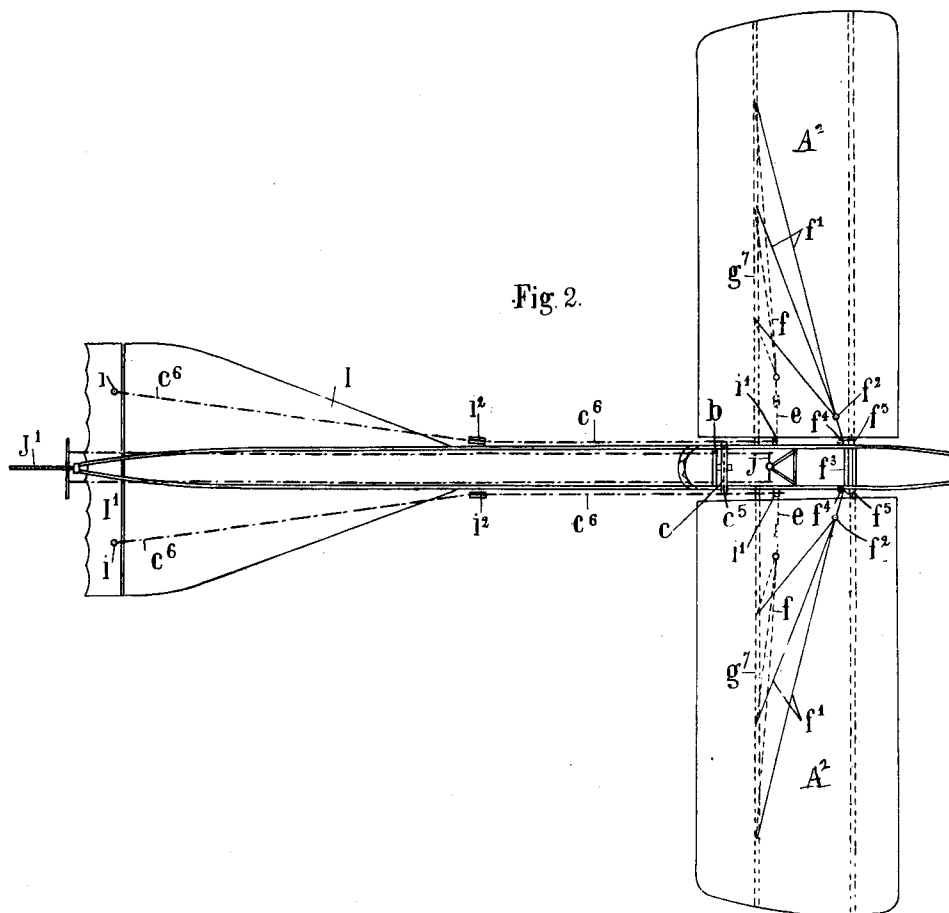
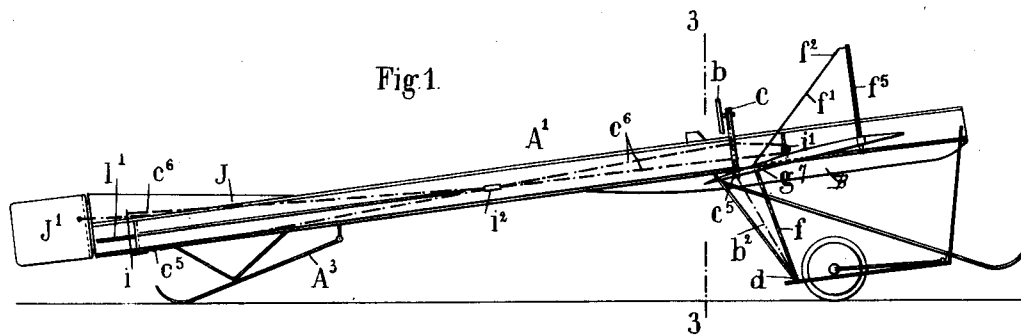


A. J. A. DEPERDUSSIN.
AEROPLANE.
APPLICATION FILED JAN. 16, 1911.

1,049,820.

Patented Jan. 7, 1913.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

Fig. 3.

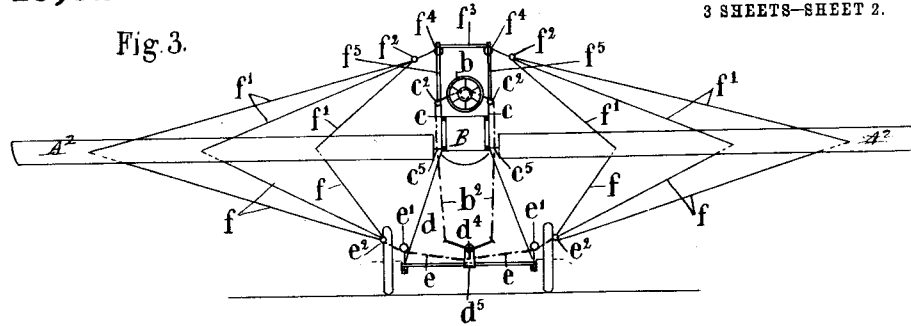


Fig. 4.

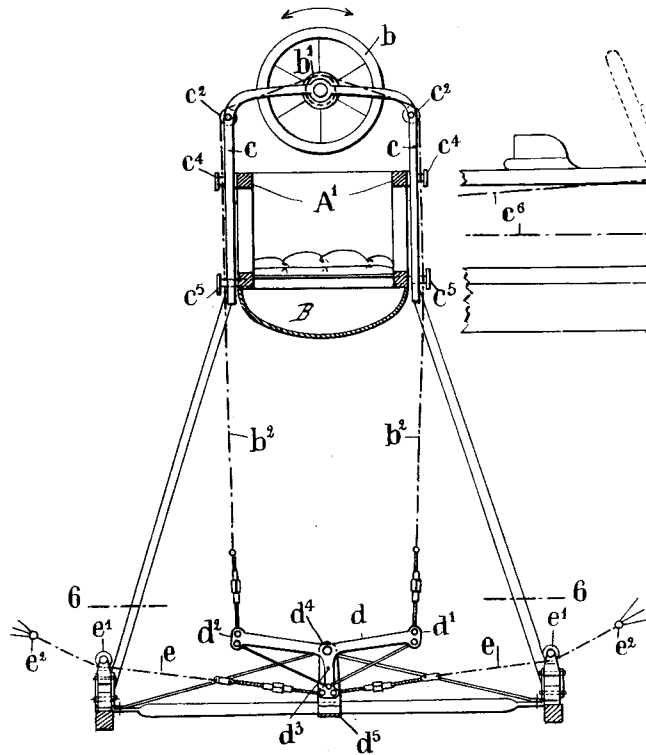


Fig. 5.

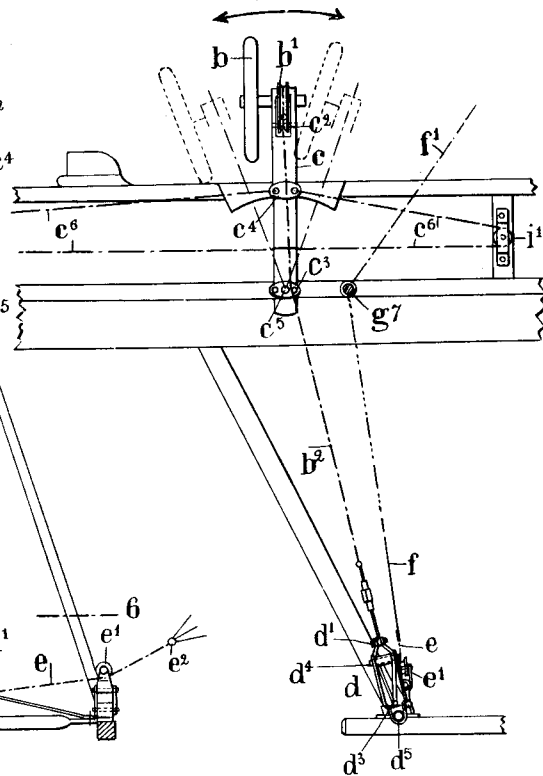
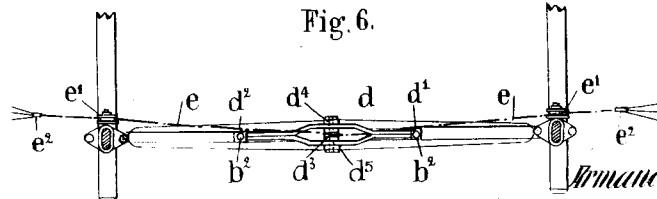


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 7.

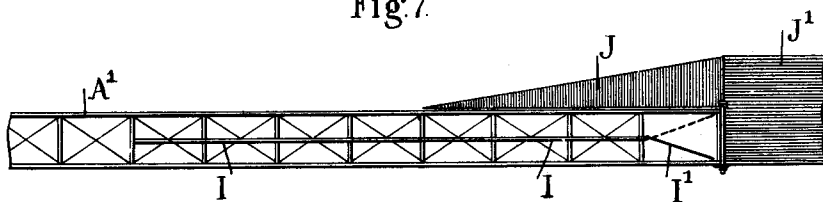
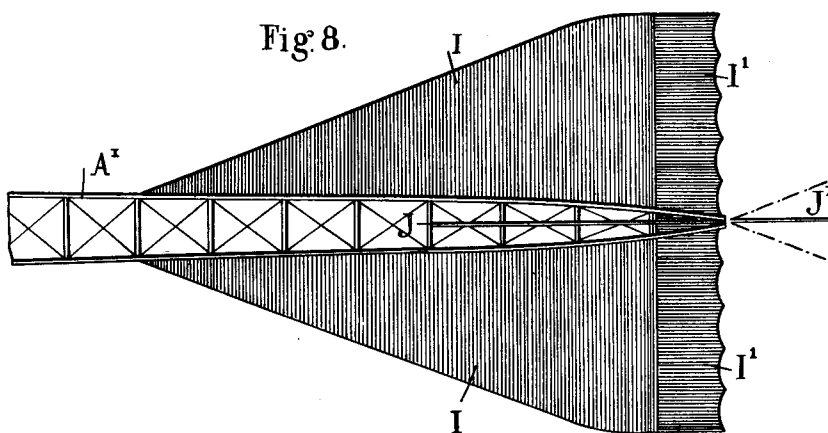


Fig. 8.



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UNITED STATES PATENT OFFICE.

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AEROPLANE.

1,049,820.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed January 16, 1911. Serial No. 602,902.

To all whom it may concern:

Be it known that I, ARMAND JEAN AUGUSTE DEPERDUSSIN, a citizen of the Republic of France, and a resident of 9 Rue des Entrepreneurs, Paris, France, have invented new and useful Improvements in Aeroplanes, of which the following is a specification.

My invention relates to aeroplanes and consists in improvements in monoplane machines wherein it is sought to improve and simplify the devices which effect the balancing and operation thereof.

Control of an aeroplane by means of a hand wheel journaled upon a pivoted column, the wheel operating by means of a drum which is mounted in a gap in a double socket-piece which supports the column cords or the like, the cords passing over pulleys which are substantially in a line with the pivots of the socket-piece, are well-known, such construction providing for operation of the cord lever secured upon its axle by the pivotal movement of the column; the present invention contemplates the use of a controlling wheel of this kind mounted upon a pivoted bow or bridge of inverted U-shape, which spans the width of the fuselage, the ends of the arms of the bow being pivoted at two fixed points located on either side of the fuselage, one of the arms of the bridge carrying the cables which operate the altitude rudder. Such arrangement permits utilization of the rigidity of the main frames to resist the pull of the cables while the shape of the bridge allows room for the pilot's legs. With this arrangement the controlling cables are separated the whole width of the frame; it is therefore convenient to connect them to the ends of the long horizontal arms of a three-arm lever placed upon the landing frame of the apparatus and having a short third arm attached to the operating cables which pass toward the planes over two pulleys located substantially at the same height as the end of the short arm.

The use of a chain wheel or pulley at the bottom of an aeroplane frame which is connected to the planes by chains or cords and controlled by two lever arms through the medium of cords which are led down from the operating hand wheel are well-known; in the present instance, however, the arrangement of the long horizontal levers,

corresponding to the width of the frame, and the provision of the short vertical arm with the guide pulleys whereby vertical reactions are obviated, present especial advantages.

The lattice girder which forms the main frame or fuselage of the machine carries the usual tail made up of horizontal and vertical planes or flukes at its rear end, while at the rear end of the frame the steering rudder is pivoted, the altitude rudder being located in a cell or compartment of the girder in front of the pivot of the steering rudder.

Reference is to be had to the accompanying sheets of drawings forming a part of this specification in which similar characters denote corresponding parts in all the views and in which—

Figure 1 is an elevation of the apparatus; Fig. 2 is a plan view thereof; Fig. 3 is a sectional view on the line 3—3 of Fig. 1 looking from the left; Fig. 4 is a detail elevation on a larger scale showing the horizontal rudder and the controlling means for tilting; Fig. 5 is a side view corresponding to Fig. 4; Fig. 6 is a sectional view on the line 6—6 of Fig. 4; Fig. 7 is an elevation of the rear portion of the frame; Fig. 8 is a corresponding plan view.

The structure consists of a frame consisting of a light lattice girder A' carrying at its front end tiltable lateral wings A² and supporting at its rear a tail piece with horizontal and vertical planes or flukes I, J, and the altitude and steering rudders I', J'.

At the front of and underneath the frame there is provided a hollow hull B, preferably formed of sheets of wood or metal laid upon ribs. This hull being located beneath the front of the lattice girder reinforces the front of the frame and increases its resistance to shocks. It moreover allows forming an opening in the lattice girder to accommodate the aviator, the engine, and tanks.

At the rear end of the lattice girder A' (Figs. 7 and 8) an open cell or compartment is provided for the accommodation of the horizontal rudder I'; this altitude rudder forms an extension of the horizontal plane or fluke I of the tail while the rudder J', which effects the steering, forms an extension of the horizontal plane or fluke I of the tail, the rudder J', which effects the

steering laterally, forming an extension of the vertical plane or fluke J, being mounted upon the extreme edge of the lattice girder. By this arrangement the rudders constitute surfaces continuous with the flukes and any division or break between these respective surfaces is avoided.

The control of the tilting of the wings and of the rudders is effected in the following manner: In front of the aviator's seat is arranged a wheel *b* journaled upon a bridge *c* of inverted U-shape, mounted upon the fuselage at points *c*⁵ around which it can oscillate. Upon the spindle of the wheel a grooved pulley *b*¹ is keyed; there being cables *b*² engaging the pulley, the cables passing over rollers *c*² arranged upon the bridge *c*, and other rollers *c*³ (Fig. 5) arranged as near the pivotal points *c*⁵ as possible; these cables are furnished with turn-buckles and are connected to the extremities of the arms *d*¹ and *d*² of a lever *d* made up of three arms *d*¹, *d*², *d*³, pivoted at *d*⁴ upon a support *d*⁵ secured to the landing frame; from the lower arm *d*³ two cables *e* extend, provided with turn-buckles and passing over rollers *e*¹ to a junction *e*² attached to a number of cables *f* secured to the cross bar *g*¹ of the wings of the apparatus (Fig. 3 and dotted lines of Fig. 2). Upon this same cross bar but on the upper side of the wing, cables *f*¹ are secured which correspond to the cables *f* and lead to junctions *f*² which are connected by a cable *f*³ which passes over rollers *f*⁴ fixed to the uprights *f*⁵ which form part of the fuselage.

Upon each side of the bridge *c* loops or bridles *c*⁴ are arranged which have cables *c*⁵ leading to the extremities of rods *i* secured to the vertical rudder I'. One end of the cables passes directly over a pulley *i*¹ in order to effect the operation of the rudder in both directions; these cables are guided by means of tubes *i*² fixed to the fuselage.

In order to effect the tilting of the machine, the aviator turns the wheel *b* in the required direction, the three-arm lever swinging and pulling one of the cables *e*, while the other slackens the same amount, the lower cables *f* and upper ones *f*¹ following this movement and producing the tilting of the wings. To operate the altitude rudder the airman pushes or pulls, as the case may be, upon the hand wheel *b*, the bridge *c* swinging around the pivots *c*⁵ (shown in dotted lines in Fig. 5) thereby operating the rudder I' by means of the cables *c*⁵. This movement of the bridge *c* does not affect the control of the tilting because the cables *b*² pass substantially through the centers of rotation *c*⁵ in a well-known manner.

The steering or horizontal rudder J' is

actuated by means of a foot lever *j* which is pivoted at its center.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent:—

1. An aeroplane comprising a longitudinal frame having a seat for the aviator near its front end, and lateral tiltable wings, a bridge frame having an inverted U form which spans the main frame and whose legs are pivoted at their lower ends in advance of the aviator's seat, the upper end of the pivoted frame being thus adapted to swing forward and back, cables connected with the wings, and a wheel located on the swinging frame and adapted for access to and operation by the aviator for taking up and slackening the cables, as described.

2. An aeroplane comprising a longitudinal frame, controllable steering devices mounted thereon, a swinging frame pivoted on the main frame, a wheel journaled in said frame, cables operatively connecting the wheel and steering devices, a three-armed lever pivotally carried at the lower portion of the landing frame of the apparatus, the said cables being in engagement with the extremities of the two long arms of the said levers, warping or steering cables secured to the short arm of the said lever, the said warping or steering cables passing over suitable pulleys which are located at substantially the same height as the end of the short arm.

3. A monoplane flying machine, comprising a longitudinal frame, said frame consisting of a lattice girder, side planes attached to the front of said frame and adapted to be tilted, cross-bars secured to said planes, a tail secured to said frame, vertical and horizontal surfaces to said tail, a rudder controlling the elevation, said elevation-rudder being in extension of said horizontal surface, a steering rudder, said steering rudder being in extension of said vertical surface, a structure mounted within reach of the operator, said structure adapted to be tilted about an axis, reciprocal connections from said tiltable structure to said elevation rudder, a hand-wheel mounted upon said structure, a pulley revoluble by said hand-wheel, and tensile connections from said pulley to said cross-bars, said connections passing near the tilting axis of said structure.

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

ARMAND JEAN AUGUSTE DEPERDUSSIN.

Witnesses:

JACQUES LEJEUNE,
H. C. COXE.