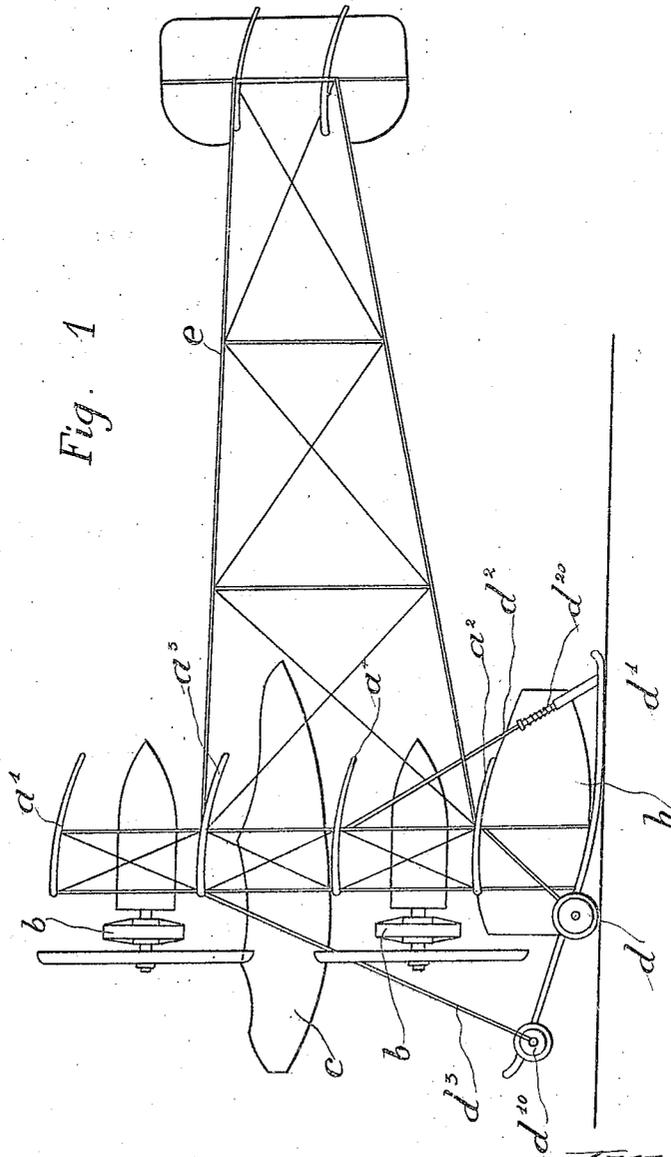


Jan. 2, 1923.

L. BLÉRIOT.
AEROPLANE OR THE LIKE.
FILED FEB. 16, 1918.

1,441,056.

6 SHEETS—SHEET 1.



Witnesses:
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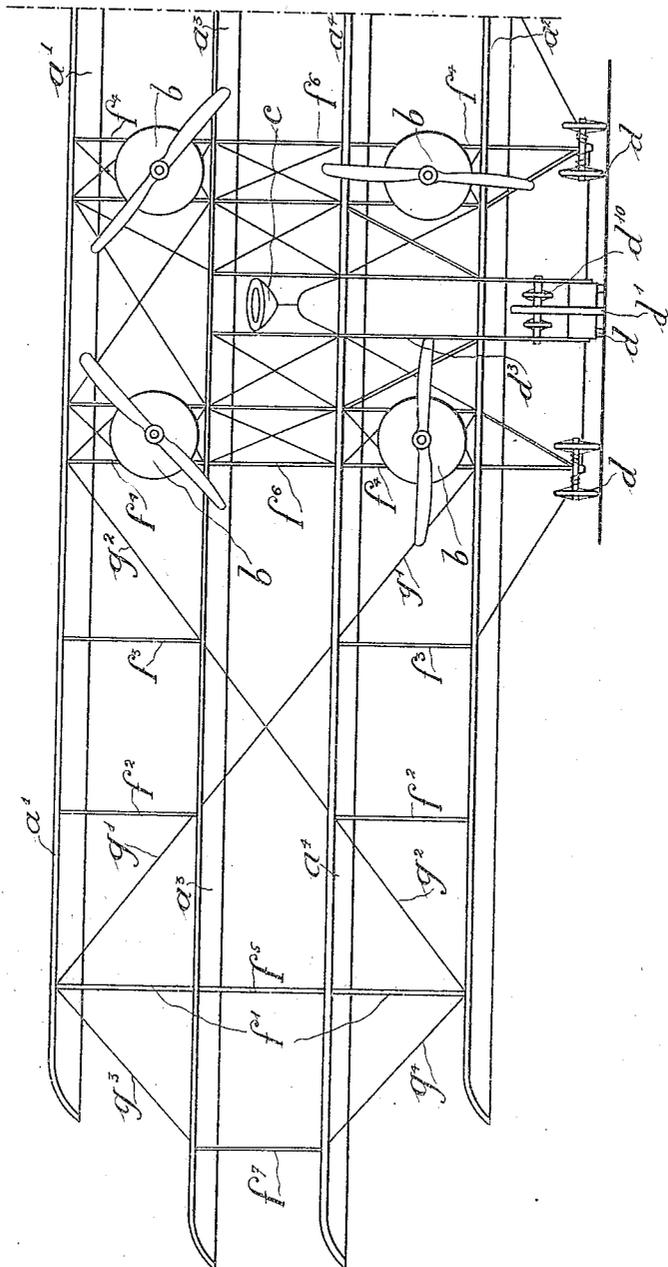
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6 SHEETS—SHEET 2.

Fig. 2.



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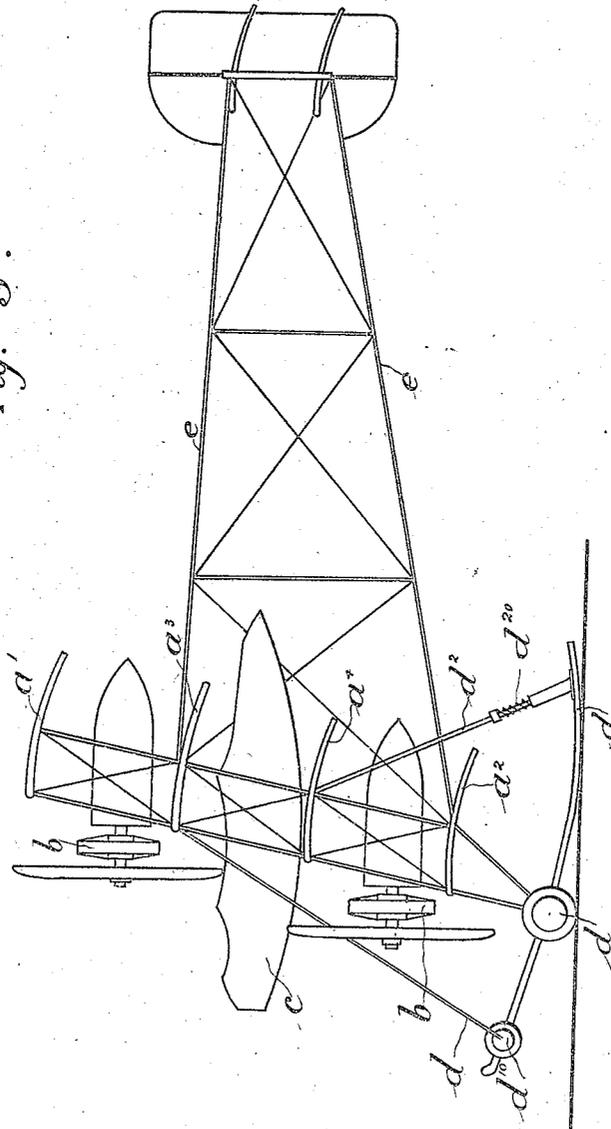
Jan. 2, 1923.

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1,441,056.

6 SHEETS—SHEET 3

Fig. 3.



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6 SHEETS—SHEET 4.

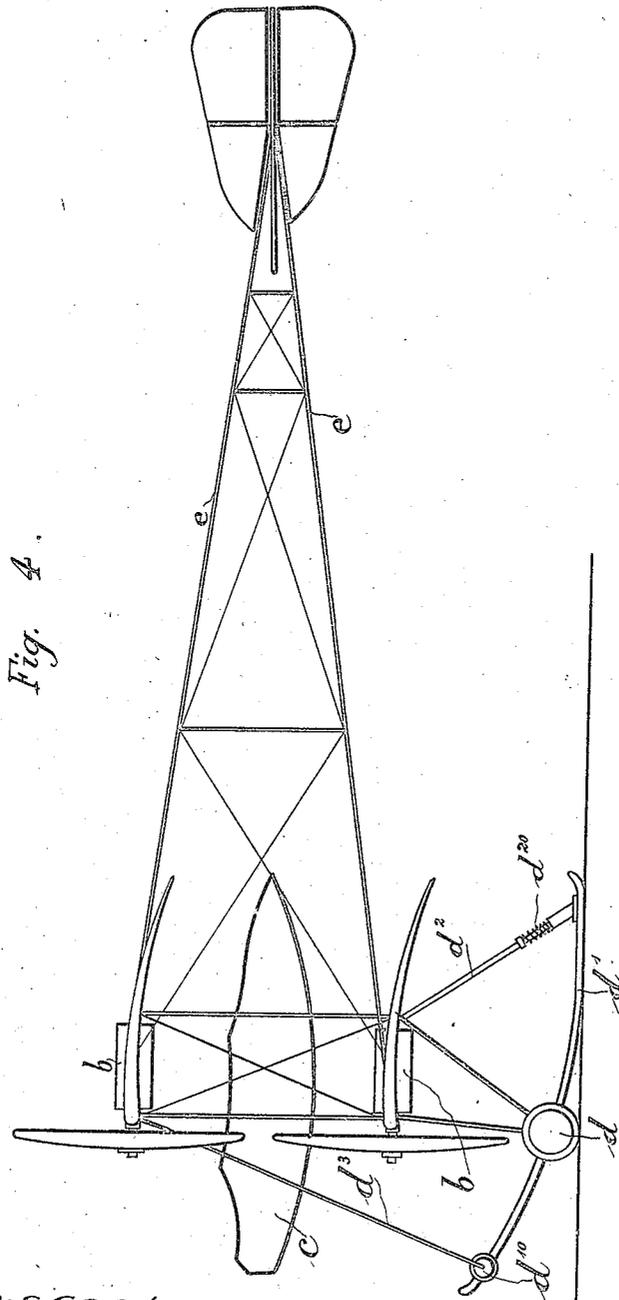


Fig. 4.

Witnesses:
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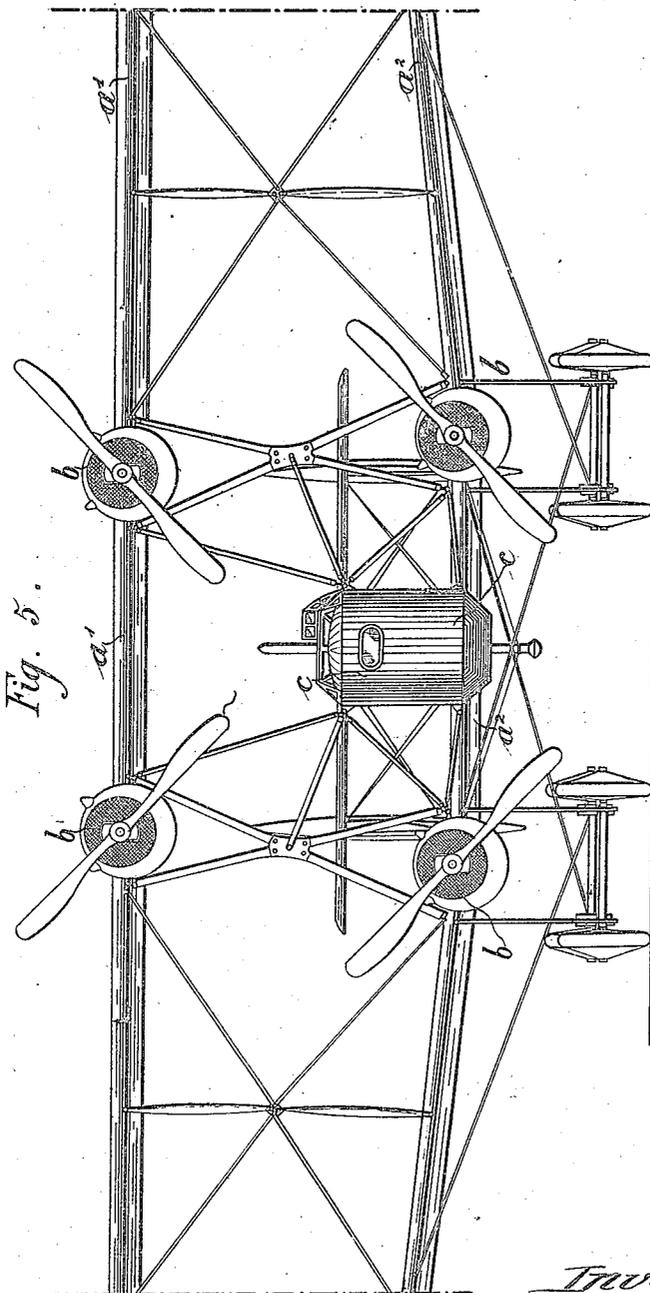
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1,441,056.

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AEROPLANE OR THE LIKE.
FILED FEB. 16, 1918.

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1,441,056.

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AEROPLANE OR THE LIKE.
FILED FEB. 16, 1918.

6 SHEETS—SHEET 6.

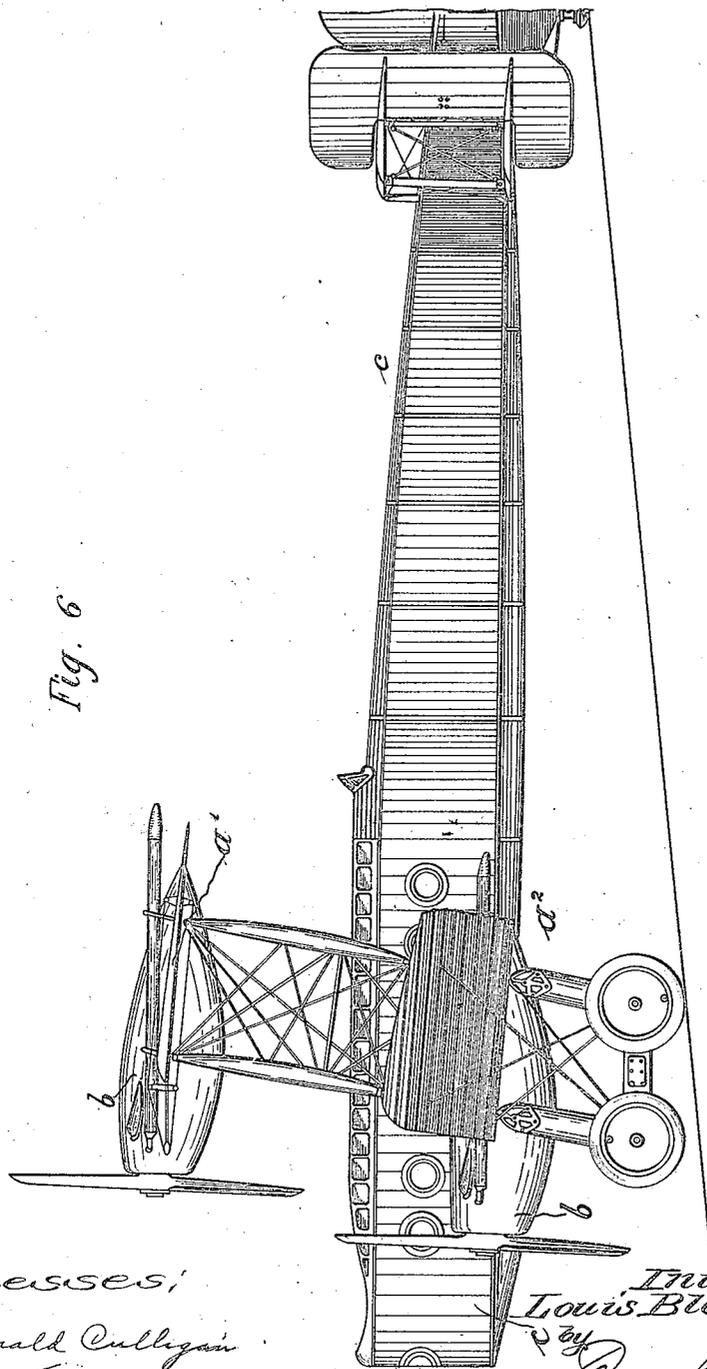


Fig. 6

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UNITED STATES PATENT OFFICE.

LOUIS BLÉRIOT, OF SURESNES, FRANCE.

AEROPLANE OR THE LIKE.

Application filed February 16 1918. Serial No. 217,606.

(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313.)

To all whom it may concern:

Be it known that I, LOUIS BLÉRIOT, engineer, a citizen of the French Republic, residing at Suresnes, France, have invented certain new and useful Improvements in Aeroplanes or the like (for which I have filed applications in France, filed February 24, 1916, Patent No. 502,839; and in France, filed June 18, 1917, and in Great Britain, filed December 29, 1916, Patent No. 130,372), of which the following is a specification.

This invention relates to aeroplanes or the like.

The invention has for its main object to construct aeroplanes or the like with a large number of engines which are mounted as close as possible to the axis of the machine.

The invention comprises an aeroplane having several engines mounted at the corners of a square or polygon having its centre on the longitudinal axis of the said aeroplane, and the sides practically equal to the diameter of the propellers to be mounted on the shafts of the said engines.

The invention further comprises certain other arrangements, more explicitly referred to hereinafter.

The invention will be clearly understood from the following description and the accompanying drawings, by way of example.

Figures 1 and 2 show respectively in side and in front elevation, an aeroplane built according to the first method of carrying out the invention.

Figure 3 shows, in side elevation, an aeroplane built in accordance with the second method of carrying out the invention.

Figure 4 shows in side elevation a biplane built according to the third method of carrying out the invention.

Figures 5 and 6 show respectively in front and side elevation, a biplane built according to the fourth method of carrying out the invention.

A four-plane aeroplane with four engines will first be described.

The cells are built, each of two planes, and preferably the upper plane a^1 of the first cell is equal in size to the lower plane

a^2 of the second cell. The lower plane a^3 of the first cell is preferably equal in size to the upper plane a^4 of the second cell and has a greater spread than the upper plane a^1 .

In each of the cells are mounted two engines b arranged symmetrically relatively to the central vertical plane, by placing them at such a distance from the said central plane that the distance between the axes of the two engines is slightly greater than the diameter of the propellers which are mounted on the shafts of the said engine.

The first cell is mounted above the second, either as shown in Figure 1, or so that the four planes are arranged in the form of steps. Care must be taken to choose the distance between the upper plane a^4 of the second cell and the lower plane a^3 of the first cell so that the distance between the two horizontal planes (passing through the axes of the propellers of the engines mounted in the first cell, and through the axes of the propellers of the engines mounted in the second cell) is slightly greater than the diameter of the said propellers.

The cells thus mounted are provided with stays in the ordinary manner. Between the two cells is mounted a nacelle c for the pilot and the passengers so that the central vertical plane of the said nacelle passes through the longitudinal axis of the aeroplane. Under the bottom cells is fixed a landing frame d , at the back of the said cells are mounted struts e supporting the rear planes and the vertical and horizontal rudders and finally the aeroplane is provided with suitable control devices. The result of the above is a four-engine aeroplane in which the engines are arranged at the corners of a square, the centre of which is in the longitudinal axis of the aeroplane, and the side of which is substantially equal to the diameter of the propellers. Owing to this the engines are as near as possible to the longitudinal axis of the aeroplane, and the torque about a vertical axis, produced by each of these engines when one or more of them ceases to work, is reduced to a minimum.

There may also be a minimum of stays

used for the planes by connecting them to the ends of each of the cells to the point where the engine is mounted. Four uprights $f^1 f^2 f^3 f^4$ are used, and for connecting together the two cells, two uprights f^5 and f^6 which are placed in line respectively with the uprights f^1 and f^4 . An additional upright f^7 is mounted near the end of the planes at a distance from the uprights f^1 which is practically equal to the distance between the uprights f^1 and f^2 . The distance between the various uprights is such that a straight line starting from the upper end of the upright f^1 of the upper cell and terminating at the lower end of the upright f^4 of the bottom cell, passes through the bottom end of the upright f^2 of the upper cell, and through the upper end of the upright f^3 of the lower cell. In that way, it is only necessary to use the following stays, namely, a wire g^1 starting from the upper end of the upright f^1 of the upper cell, passing through the bottom end of the upright f^2 of the said cell, through the upper end of the upright f^3 of the bottom cell and terminating at the lower end of the upright f^4 of the said cell. A wire g^2 starting from the upper end of the upright f^4 of the upper cell, passing through the bottom end of the upright f^3 of the said cell, through the upper end of the upright f^2 of the bottom cell, and terminating at the bottom end of the upright f^1 of the said cell. A wire g^3 connecting the upper end of the upright f^1 of the upper cell to the upper end of the upright f^7 and a wire g^4 connecting the bottom end of the upright f^7 to the bottom end of the upright f^1 of the bottom cell. Such a system of strengthening, whilst offering comparatively no resistance to advance, ensures in a perfect manner rigidity and indeformability of the planes.

A landing frame d is constituted by three frames, one of which is arranged in the central plane, and the two others are arranged laterally considerably below the engines. The lateral frames have the axle of their wheels suspended to a triangular frame, the hypotenuse of which is situated inside so that the said lateral frame can resist lateral shocks better.

The landing frames are constructed so that each of them comprises two bearing wheels, and the central frame comprises in addition a runner d^1 so arranged that when the aeroplane rests on the ground, it rests on its wheels and its runner, without any fear of its tail ever coming into contact with the ground. The runner in the example illustrated is provided in front with two small auxiliary wheels d^{10} . The runner is also preferably connected to the body of the aeroplane at its rear end, by a rod d^2 provided with a shock absorber d^{20} acting in the vertical direction, and at its front

end by a pair of rods d^3 which are preferably utilized also for supporting the nacelle c .

The planes are so arranged that only the bottom surface of the upper cell and the upper surface of the bottom cell can be warped.

There is mounted on the landing frame a receptacle in which are placed bombs or other projectiles.

Obviously the invention is not limited to the constructions described but comprises modifications, that is to say, the four engines might be mounted so that they are at the corners of a square on an aeroplane other than a quadruplane, on a quintuplane or even, as shown in Figure 4, on a biplane, in the latter case very flat engines could advantageously be used because they could be mounted without materially projecting above and below the planes in recesses provided therein.

In the latter case, also, if it is desired that the nacelle c be supported directly by the lower plane a^2 , as shown in Figures 5 and 6, it is necessary to increase the distance between the two engines b so that the distance between the axes of the two engines is slightly greater than the sum of the diameter of their propellers and of the width of the nacelle c .

The engines are then mounted at the corners of a trapezium.

When it is desired to make use of a number of engines greater than four, the said engines are arranged at the corners of a polygon, the center of which is in the longitudinal axis of the aeroplane.

Obviously also the nacelle c could constitute the fuselage of the aeroplane.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In an aeroplane a plurality of engines mounted at the corners of a geometrical figure having at least four corners, said figure having its center on the longitudinal axis of the aeroplane and its sides practically equal to the diameter of the propellers to be mounted on the shafts of the engines, said figure lying in a plane substantially perpendicular to the longitudinal axis of the aeroplane.

2. In an aeroplane a set of at least four engines arranged at the respective corners of a geometrical figure which lies in a plane transverse to the longitudinal axis of the aeroplane, the distance between the axes of the different engines being slightly greater than the diameter of the propellers to be mounted on the shafts of the respective engines.

3. In an aeroplane a set of at least four engines arranged to define the respective

corners of a geometrical figure which lies in a plane substantially perpendicular to the longitudinal axis of the aeroplane and whose center is substantially coincident with the longitudinal axis of the aeroplane.

4. An aeroplane comprising two superposed cells, each constituted by two planes, two engines carried by each cell arranged symmetrically relatively to a central vertical plane, the said engines being so located in relation to said plane that the distance between the shafts of the engines is slightly greater than the diameter of the propellers to be mounted thereon.

5. In an aeroplane having a plurality of planes, a plurality of engines arranged in vertical sets symmetrically disposed with relation to a central vertical plane, spaced uprights between which each set of engines is mounted, one upright of each pair being continued below the lower plane and an inclined strut connecting the lower terminals of each pair of uprights so as to provide a

triangular landing frame for resisting lateral shocks.

6. In an aeroplane two superposed cells, each constituted by two planes, means for supporting engines in vertical alignment with one engine in each of said cells, uprights passing through all of said planes adjacent the engines and near the ends of the upper and lower planes, tension members connecting diagonal opposite corners of said uprights, additional uprights interposed between the intermediate planes beyond the ends of said upper and lower planes and flexible connections between said additional uprights and said end uprights.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

LOUIS BLÉRIOT.

Witnesses:

CHAS. P. PRESSLY,
PAUL BLUM.