E. LOSSE.

AERIAL MACHINE.

APPLICATION FILED MAR. 22, 1910.

995,361

Patented June 13, 1911.

5 SHEETS—SHEET 1.

Fig. 1.

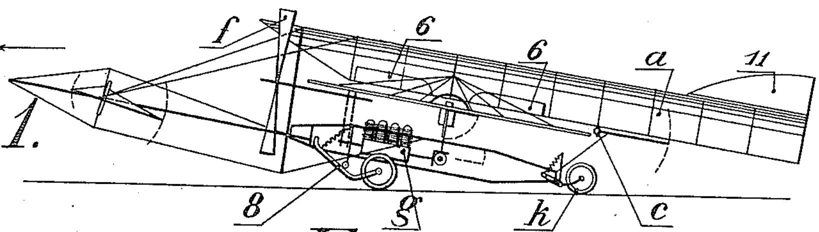


Fig. 2.

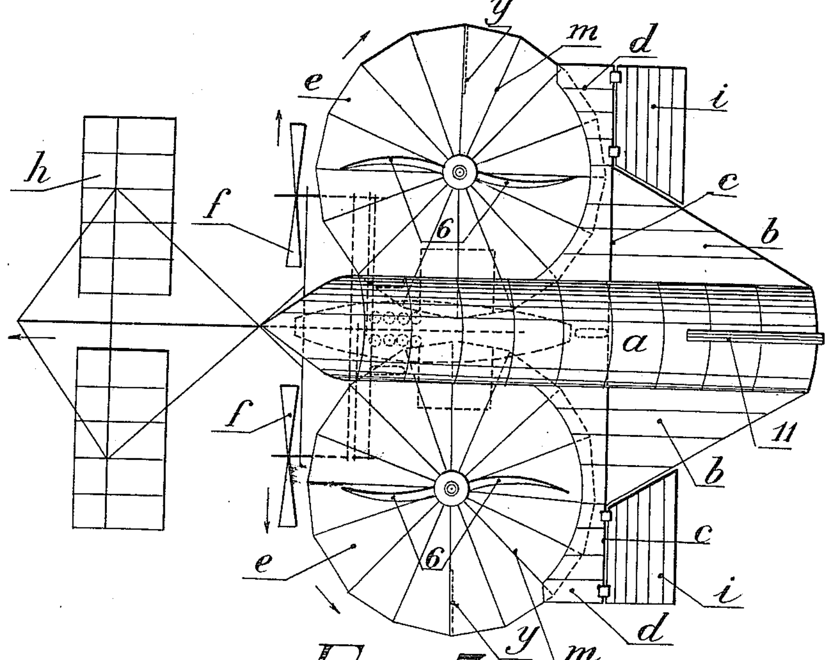
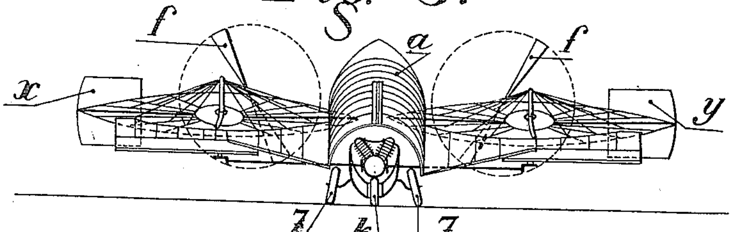


Fig. 3.



Witnesses:

Inventor:

attorney.

E. LOSSE.

AERIAL MACHINE.

APPLICATION FILED MAR. 22, 1910.

995,361.

Patented June 13, 1911.

5 SHEETS—SHEET 2.

Fig. 4.

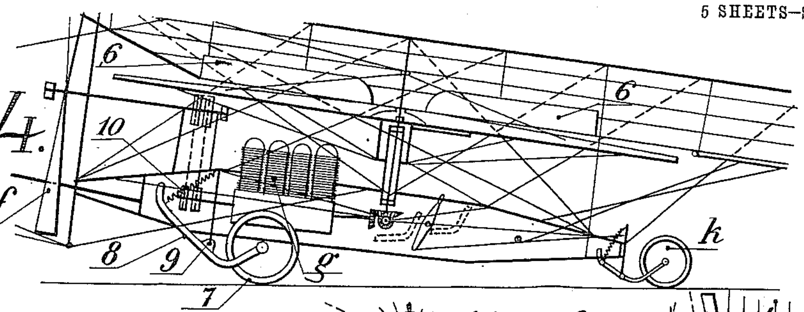


Fig. 5.

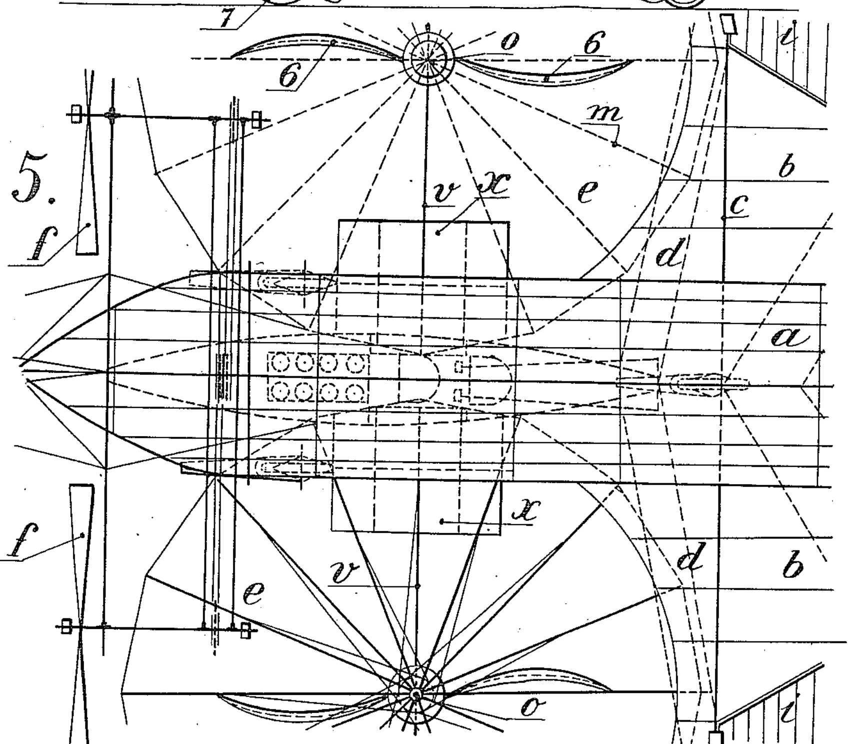
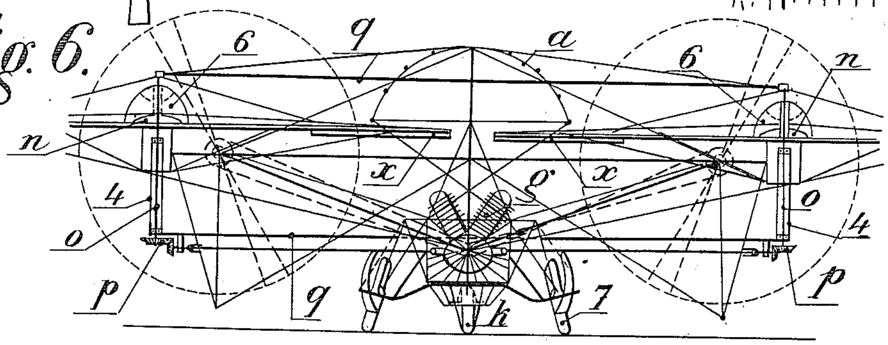


Fig. 6.



Witnesses:
Emil Weinert
Charles Lindt

Inventor:
Emile Losse
by Ferdinand Nusil
Attorney

E. LOSSE.

AERIAL MACHINE.

APPLICATION FILED MAR. 22, 1910.

995,361. Patented June 13, 1911.

5 SHEETS—SHEET 3.

Fig. 7

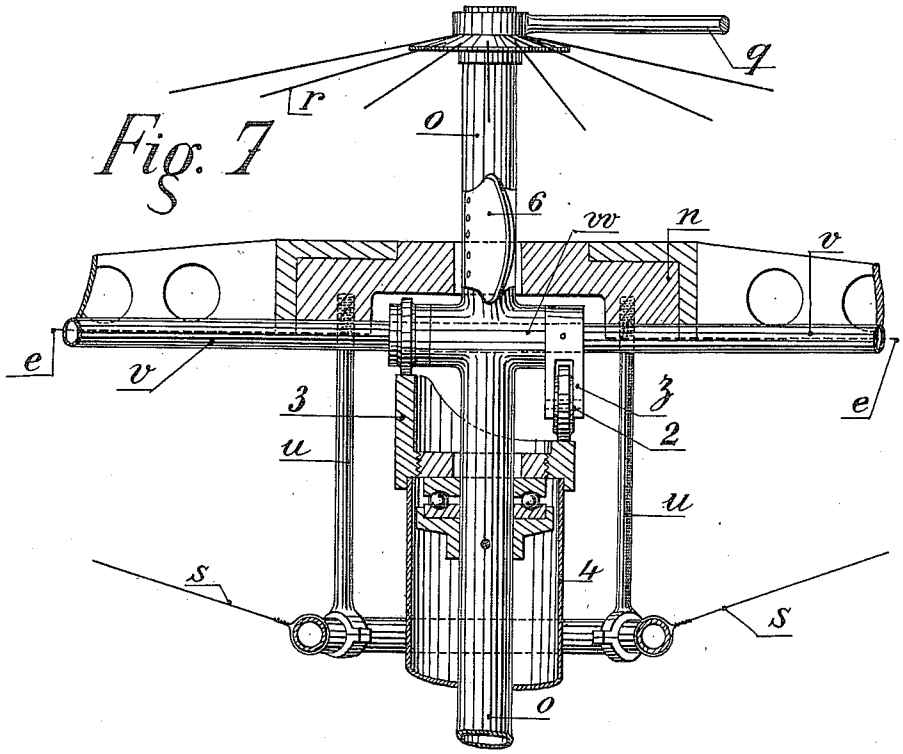
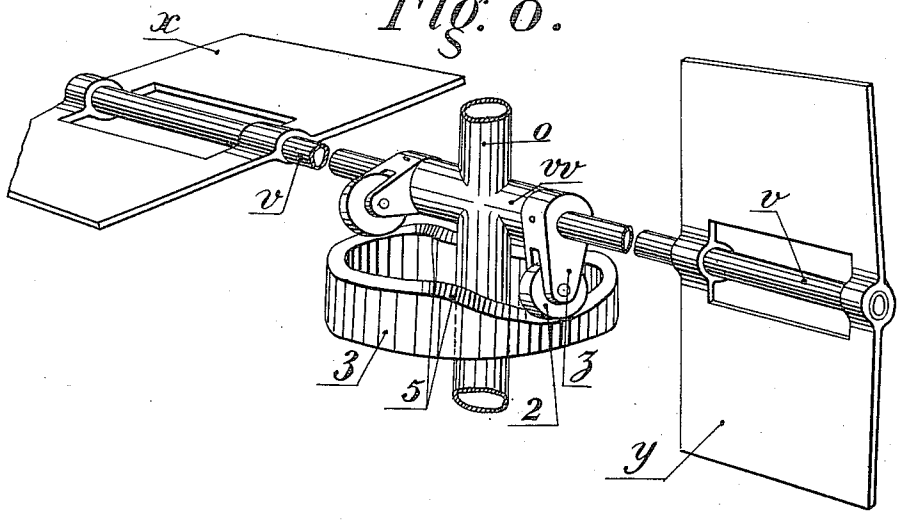


Fig. 8.



Witnesses:
Emil Weinert
Charles Smith

Inventor:
Emile Losse
by Fred'k Wm Wentz
Attorney

E. LOSSE.
AERIAL MACHINE.
APPLICATION FILED MAR. 22, 1910.

995,361. Patented June 13, 1911.

5 SHEETS—SHEET 4.

Fig. 9.

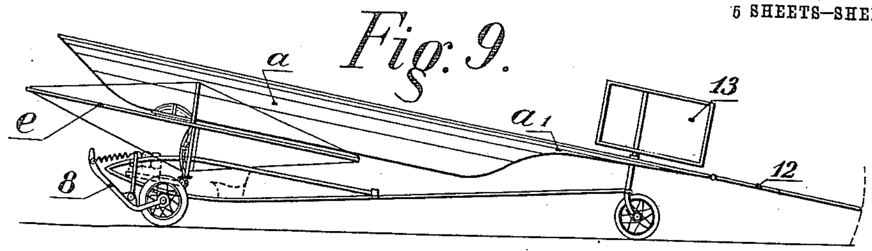


Fig. 10.

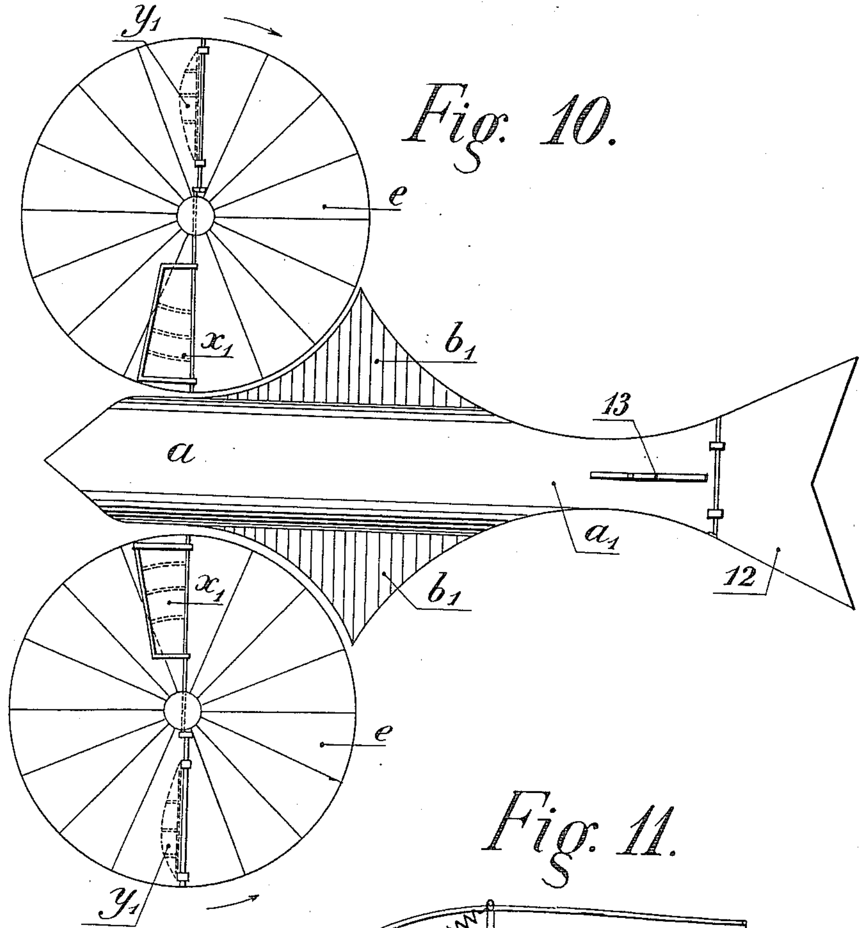
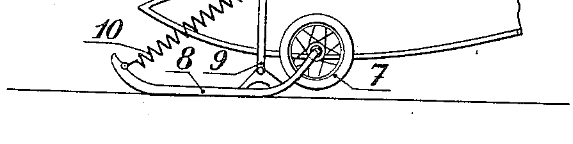


Fig. 11.



Witnesses:
Emil Weinert
Charles Smith

Inventor:
Emile Losse
by [signature]
Attorneys

E. LOSSE.

AERIAL MACHINE.

APPLICATION FILED MAR. 22, 1910.

995,361.

Patented June 13, 1911.

5 SHEETS—SHEET 5.

Fig. 12.

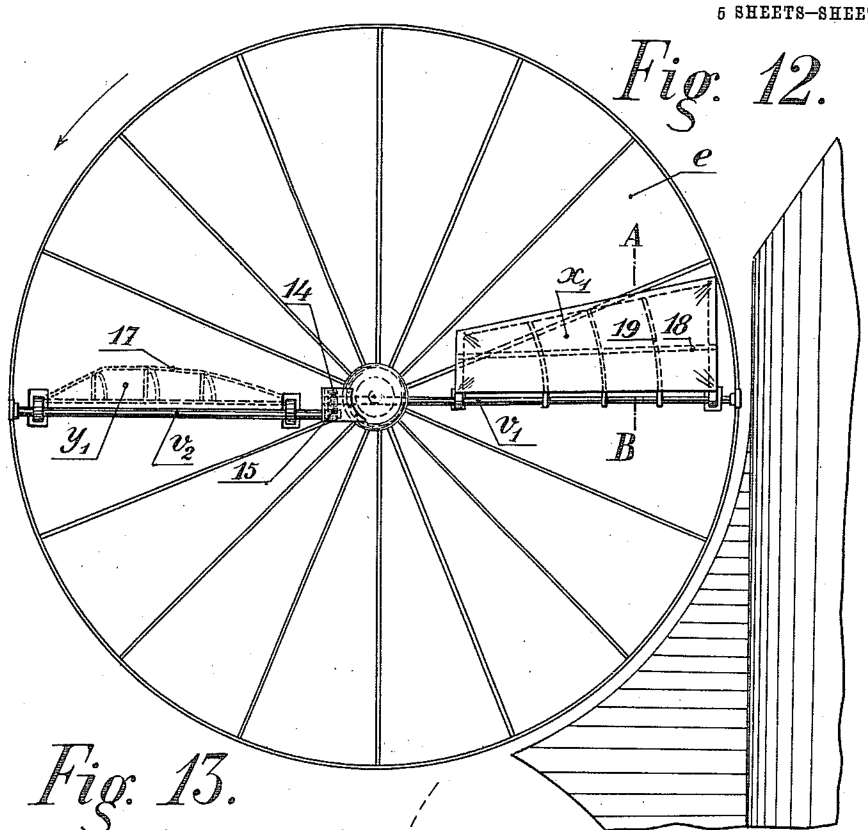


Fig. 13.

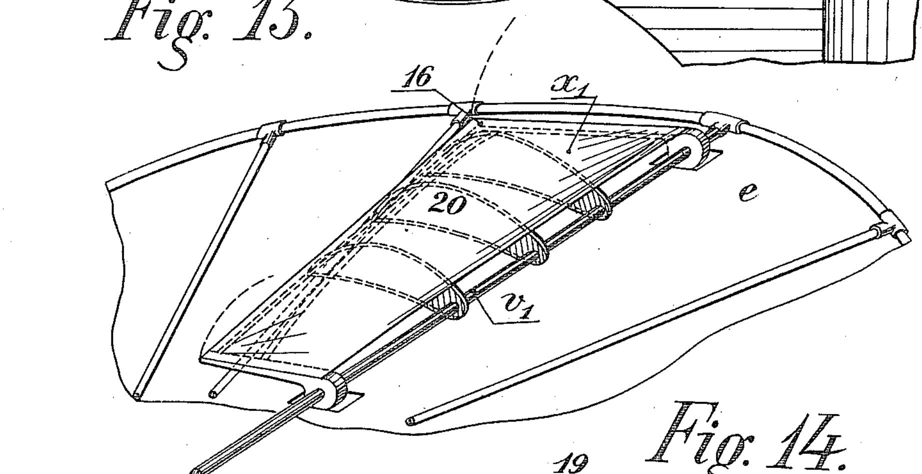
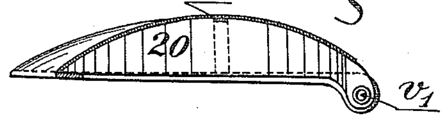


Fig. 14.



Witnesses:

Emil Weissert

Charles ...

Inventor:

Emile Losse

by ... Attorney

UNITED STATES PATENT OFFICE.

EMILE LOSSE, OF VILLENEUVE-ST.-GEORGES, FRANCE.

AERIAL MACHINE.

995,361. Specification of Letters Patent. Patented June 13, 1911.

Application filed March 22, 1910. Serial No. 550,987.

To all whom it may concern:

Be it known that I, EMILE LOSSE, a citizen of the French Republic, and resident of Villeneuve-St.-Georges, France, have invented certain new and useful Improvements in Aerial Machines, of which the following is a specification.

This invention relates to an aeroplane of improved construction, characterized by a body of the shape of a half-cylinder arranged longitudinally and by two lateral aeroplanes consisting of revoluble disks which are symmetrically arranged with regard to the axis of the machine and destined to revolve in opposite directions. Said lateral aeroplanes serve at the same time as fly-wheels for the engine and for automatically insuring the equilibrium of the machine owing to their gyroscopic effects; they further cleave the air and permit a considerable increase in the speed of the machine. Each of said disks has two blades which form oars and said oars are mechanically driven. When the force of the engine is greater than that of the wind the vanes facilitate the propulsion; while the wind acts upon the vanes if its force is greater than that of the engine adding thus its propelling power to that of the engine. Finally, the improvements relate to the arrangement of the rear rudder and to the manner in which the wheels are mounted which serve for supporting the machine on the ground.

The invention is shown in the accompanying drawings.

Figures 1, 2 and 3 represent diagrammatically, respectively in side view, plan view and end view, the aerial machine of improved construction. Figs. 4, 5 and 6 are corresponding views which show on a larger scale only a part of the machine. Figs. 7, 8 and 11 represent constructional details. Figs. 9, 10, 12, 13 and 14 show a modified construction of the aerial machine.

In the following description of the improved aerial machine I shall not give particular descriptions of the mechanical means employed for connecting the various parts of the aeroplane, nor of the means for insuring the rigidity of the frame, said means consisting in the well known bamboo rods or steel tubes and conveniently arranged stays. Said means have not been shown in the drawings as the invention merely relates to the form and special arrangement of the sustaining devices, and means for propelling and steering, but not to the manner in which they are fixed.

According to Figs. 1 to 8 the aeroplane consists essentially of the body *a* which has the form of a cylinder cut horizontally at the middle and situated along the axis of the machine and slightly inclined at the proper angle to the horizontal plane which is necessary for an easy start, and of two sustaining surfaces which are parallel with the under edges of the body and arranged at either side of the same and at the rear part. Said sustaining planes have the shape shown in Fig. 2 and they are composed of two right angled triangles *b* whose sides are directed along a generating line of the body *a* and along a cross stay *c* and of another part *d* arranged upon the other side of said cross stay. Said parts *d* extend at either side of the body *a* along the entire length of the cross stay *c* while the parts *b* extend only to about the middle of this length. The front edge of said parts *d* is curved to conform to the shape of the gyroscopic disks *e* which form the third and last part of the sustaining means.

The propelling means are constituted by two propellers *f* mounted at the front end of the machine, the shaft of the same being parallel with the axis of the body *a*. The propellers are driven from the engine *g* in any convenient manner, and there are further provided the blades or oars carried by the disks *e* which will be described hereinafter.

The means for steering consist of a front rudder *h* the arrangement and construction of which shows no novelty and of two rear rudders *i* mounted at either side of the sustaining planes *b* and hingedly connected with the ends of the cross stay *c*. Said rudders *i* are controlled by the same device which operates the rear wheel *k* and serves for steering the machine when running on the ground. This operating device for the steering rudders is constructed so that if the rear-wheel *k* is turned in one direction one of the planes *i* which form the rear rudders is turned while the other plane is turned when said rear-wheel is being turned in the opposite direction. The means for realizing these movements may be of any convenient type. Finally the steering mechanism of the machine is completed by the fixed vertical plane 11 mounted at the rear of the machine above the body *a* and along the axial line of the same.

The planes *i* permit the lateral displacement of the center of thrust of the machine which, when said planes are in normal symmetric position, is situated in the median plane of the machine.

The gyroscopic disks *e* consist of a round piece of canvas stretched by means of spokes *m* the inner ends of which are fixed in a support *n* mounted upon a shaft *o* which stand perpendicular to said piece and is driven by bevel gearing *p* (Fig. 6) which is operated from the engine. Ball-and-socket joints are employed for connecting the several parts so that the two shafts *o* are securely connected with the engine. The upper and lower ends of said shafts are strengthened by means of cross stays *q* which are parallel with the cross stay *c*. The free ends of the spokes *m* are connected with the upper end of the corresponding shaft *o* by connecting rods *r* on the one hand and with a ring *t* on the other hand by means of other connecting rods *s*. Said ring *t* is situated below the support *n* and connected with the same by a number of rods *u*, so that the frame which is thus formed can revolve around the vertical shaft *o*. A shaft *v* placed across the gyroscopic disk *e* and rigidly connected with the same is revolubly mounted in a bearing *w* which forms part of the perpendicular shaft *o*. The shaft *v* traverses the supporting piece *n* and serves for communicating the revolving motion of the vertical shaft *o* to the disk *e*. Said shaft *v* carries at either end a blade *x*—*y* said blades being arranged at right angles with regard to each other. Upon said horizontal shaft *v* there are keyed close to the bearing *w* two crank arms *z*, the supporting piece *n* having an opening in which said crank arms are located. The crank arms *z* carry at their lower ends rollers 2 which bear upon the upper edge of a fixed cam 3. This cam 3 is fixed upon the upper end of a tube 4 which surrounds the shaft *o*. The two tubes 4 are rigidly connected with each other in any convenient manner. The cam 3 presents two inclines 5 (Fig. 8) so that the horizontal shaft *v* executes at each complete revolution of the vertical shaft *o* two rotations in opposite directions. From this it follows that during the first half of the revolution of the shaft *o* and consequently of the gyroscopic disk *e* one of the blades, say *x* for example, is parallel with the said disk (Figs. 5 and 6), the other blade, *y*, standing perpendicular to the same (Figs. 2 and 3). There are further mounted upon the vertical shaft *o* and the supporting piece *n* below each of the gyroscopic disks *e* two auxiliary blades 6.

When the engine works the gyroscopic disks *e* are revolving in opposite directions and they serve as fly-wheels for the engine, at the same time equilibrating the aeroplane by means of their gyroscopic effects; said disks further cleave the air with their edges whereby they facilitate the propulsion and consequently increase the speed at which the aeroplane is running. Every time one of the blades *x*, *y*, arrives at the outer half of the disk it stands at right angles with regard to the plane of its disk, the other blade being parallel with the disk. If the force of the engine is greater than that of the wind, the outer blade acts as oar and assists in the propelling of the machine. If however the force of the wind is greater than that of the engine, the wind pushes against said outer blade and increases the speed at which the apparatus is running. The auxiliary blades 6 serve for the same purpose by utilizing the power of the air current produced by the propellers *f*.

The wheels which support the machine on the ground consist of the rear steering wheel *k* and of the two front wheels 7. The hubs of said wheels are mounted upon an angle lever pivotally mounted on an axle 9 and whose long side is capable of serving as runner. A spring 10 maintains the lever in such a position that the wheels are below the same. When the machine comes in contact with the ground the shock is deadened by said spring 10. If the shock is very strong the wheels give way turning around the pivot 9 and the machine rests upon the lever which serves as runner, (Fig. 11).

According to Figs. 9, 10, 12, 13 and 14 the sustaining planes are modified as follows:— The two lateral planes *b*, *d* of Fig. 2 are reduced and limited to the shape shown at *b'* in Fig. 10. The half-cylindrical body *a* is narrowed at its rear part a^1.

The steering planes and the steadying planes are modified as follows:—The front rudder *h* is suppressed; the side wings *i* are suppressed. The stability in longitudinal direction is obtained by means of one single horizontal rear rudder 12 of swallow tail shape and mounted behind the body a^1. The steering in horizontal direction is effected by means of the vertical rudder 13 which is substituted for the rudder 11 and consists of two planes cutting one another at right angles.

The propulsion is modified in the following manner:—The propellers *f* and the auxiliary oars 6 are suppressed. The blades *x*, *y* are only half as large as they are according to Figs. 1 to 8. For the shaft *v* made in one piece a shaft has been substituted which is composed of two parts, the one of which v_1 is slightly longer than half the shaft *v* and carries the crank arms *z* whose rollers 2 roll upon the cam 3. The other part v_2 of the shaft, instead of being in alinement with the first part, is driven by a system of two pinions 14 and 15 so that its revolving motion is effected in a direction

opposite to that in which the part v_1 revolves. Owing to this arrangement, the two blades x_1 and y_1 can be arranged at either side of the gyroscopic plane *e*.

A rope which is fixed with one end to the gyroscopic disk *e* and with the other end at the outer corner 16 of each blade is of just such a length, that the blade x_1 can adopt a direction perpendicular to the gyroscopic plane *e* so that the entire pushing strain which at that moment is very considerable is supported by said rope but not by the shaft v_1 upon which said blade x_1 is fixed.

The half-blades x_1 and y_1 instead of being plane are slightly concave as shown at 17 (Fig. 12). Said blades are strengthened by a certain number of stays 18 and cross stays 19 (Fig. 12). There are further arranged in the concavity of each blade transverse planes 20 which themselves are concave toward the center of the disk *e* so that during the revolving motion of said disk the action of these planes is added to the general action of the blade thus increasing the propulsion of the machine.

I claim:—

1. An improved aeroplane comprising three sustaining surfaces, of which one consists of a half-cylindrical body arranged along the longitudinal axis of the machine, the second of two planes mounted at either side of said body and the third of two gyroscopic disks arranged at either side of said body; propelling means consisting of two propeller screws coupled with each other and mounted at the front end of the machine, of two vanes mounted upon said gyroscopic disks and of two vertical blades mounted below said gyroscopic disks; means for steering the machine consisting of the ordinary front rudder and of two lateral rear rudders which are independent of each other and connected with the hand wheel of the steering device, and of a plane vertically mounted upon the body of said machine.

2. An improved aeroplane having mounted at either side of the axis of the machine two vertical shafts connected with the engine carrying at their upper ends gyroscopic disks which are revolved from said shafts by the intermediary of a supporting piece in which a shaft is guided which is placed across said disk and which traverses said vertical shaft, said supporting piece carrying at each end a vane which owing to the alternating revolving motion of said horizontal shaft are brought at each half of the revolution of the gyroscopic disk to the vertical position.

3. An improved aeroplane comprising in combination, sustaining surfaces consisting of a half-cylindrical body narrowed at its rear end, of two small fixed planes on either side of said body and of two gyroscopic disks; means for propelling the machine consisting exclusively of said two gyroscopic disks of which each carries two blades situated on either side of said plane and capable of rotating in opposite directions, said blades having in their concavities auxiliary planes curved toward the center of the disk, of a single steering rudder acting in vertical direction and of one single rudder of swallow-tail-shape fixed at the rear end of the machine and by a frame whose wheels are supported by runners destined to come in contact with the ground when the machine is landing.

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

EMILE LOSSE.

Witnesses:

DEAN B. MASON,

ALFRED FREY.