May 3, 1927.

J. ALBESSARD

1,627,004

AEROPLANE

Filed May 20, 1926

3 Sheets-Sheet 1

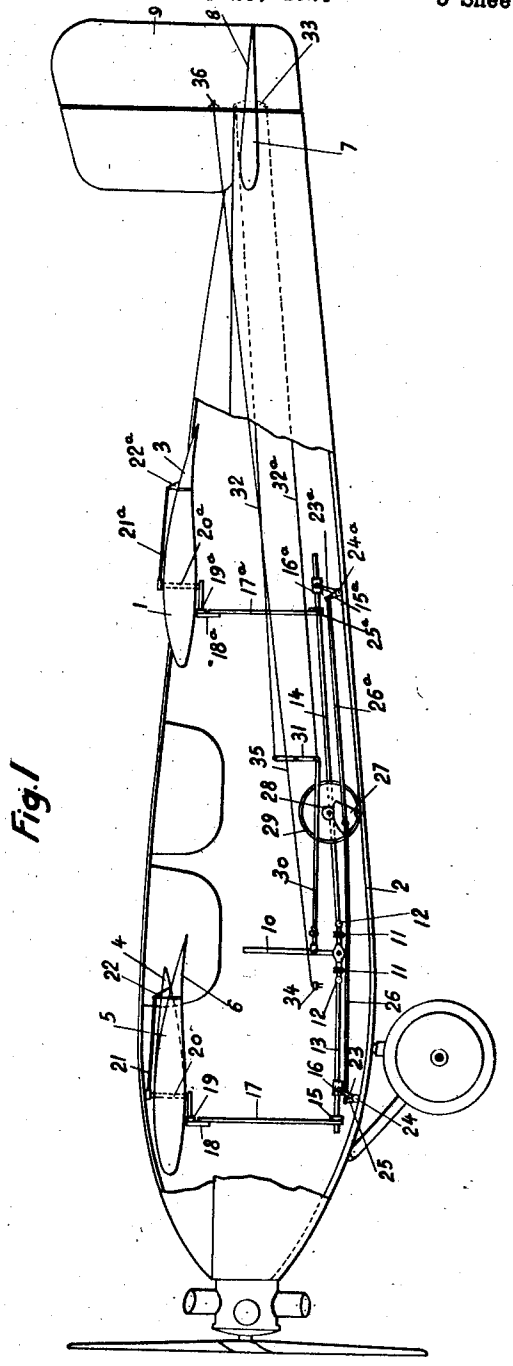


Fig. 1

Witnesses:
Henri Blouin
Andri Blouin

Inventor
Joseph Albessard

May 3, 1927.

J. ALBESSARD

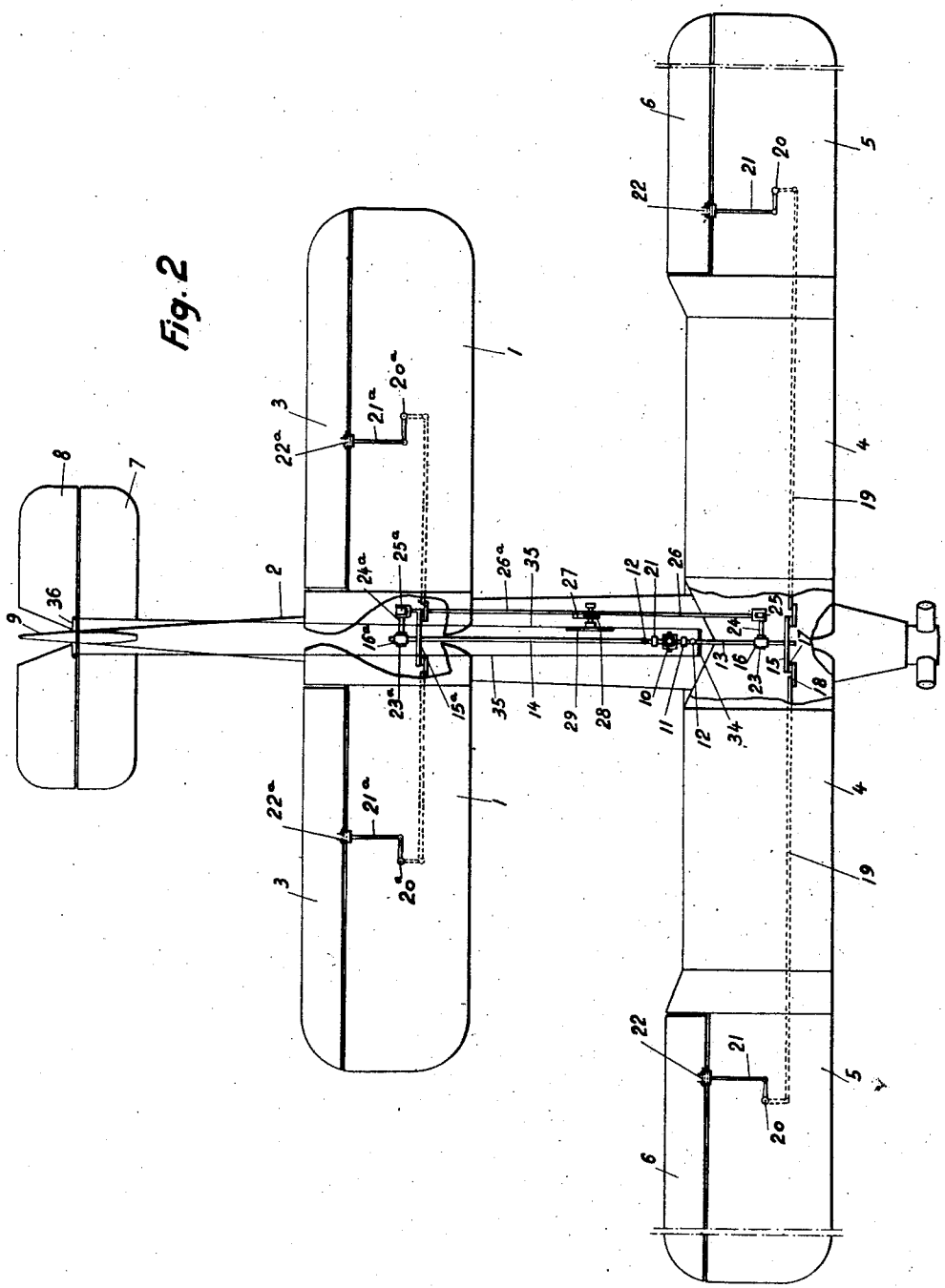
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3 Sheets-Sheet 2

Fig. 2



Witnesses:
Henri Blouin
André Blouin

Inventor
Joseph Albessard

May 3, 1927. 1,627,004

J. ALBESSARD

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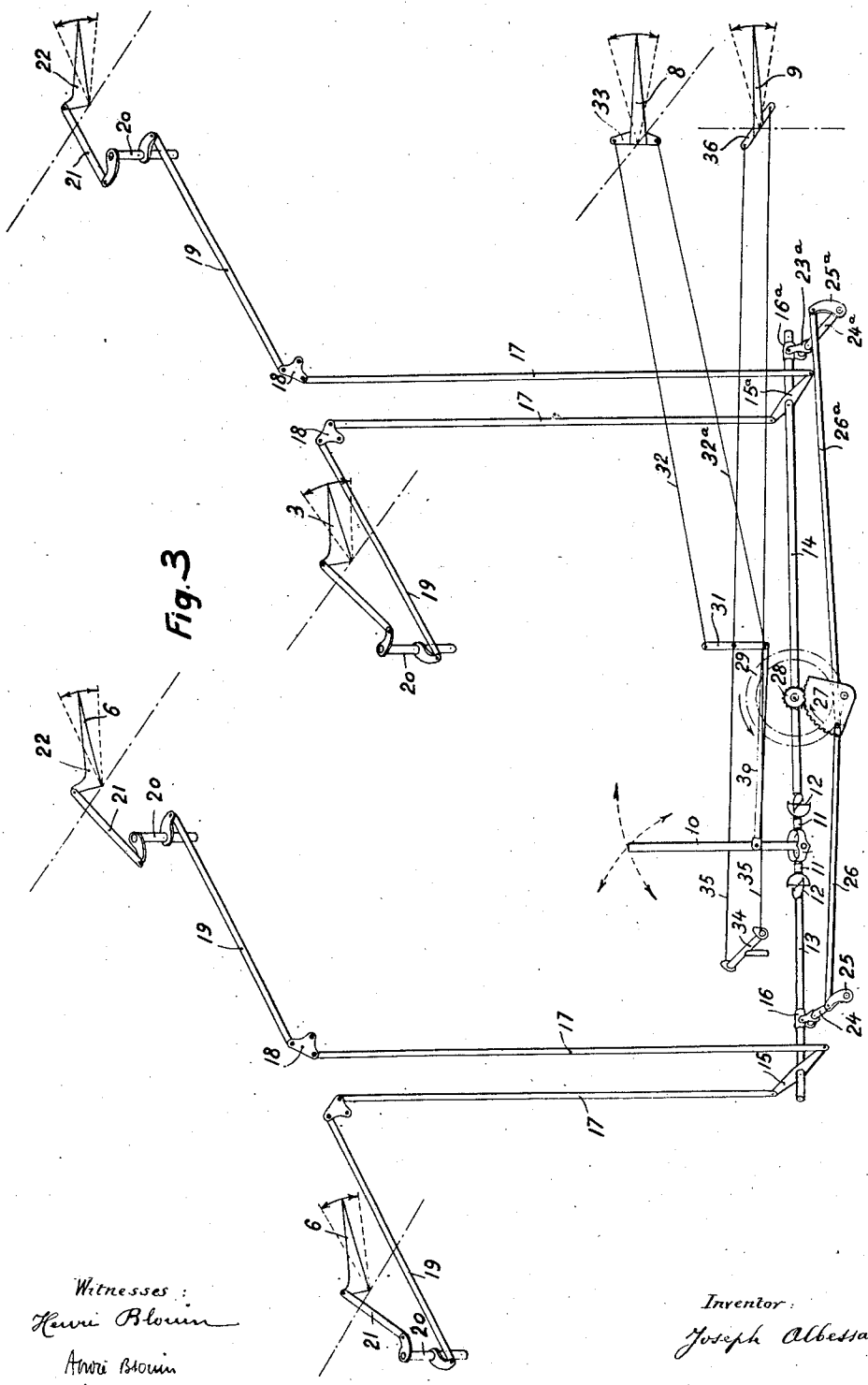


Fig. 3

Witnesses:
Henri Blouin
Henri Blouin

Inventor:
Joseph Albessard

Patented May 3, 1927. 1,627,004

UNITED STATES PATENT OFFICE.

JOSEPH ALBESSARD, OF PARIS, FRANCE.

AEROPLANE.

Application filed May 20, 1926. Serial No. 110,458.

This invention relates to an aeroplane, monoplane with surfaces in tandem arranged in such a manner that the deflection of the stream lines produced by the front wings does not unfavorably influence the lifting power of the rear wings. This result is obtained, according to the invention, by a triangular arrangement of the supporting planes which ensures the automatic stability of the apparatus and procures special guiding facilities which are completed and increased by the arrangement of the wings, each of which comprises a stationary portion and a portion movable at variable incidence, the arrangement being combined with a driving system which permits of altering at any moment by hand the incidence of the said movable portions of the wings starting from an initial incidence which may be regulated itself at the will of the pilot in accordance with the conditions of the flight, especially in the sense of increasing, at the landing, at the starting and for the change speed gear.

An aeroplane construction according to the invention is shown, by way of example, diagrammatically in the accompanying drawing, in which

Fig. 1 is a side elevation.

Fig. 2 is a plan view.

Fig. 3 is a diagram showing in perspective view the total driving mechanism.

The aeroplane according to the invention comprises at the rear a supporting plane consisting of two wings 1, 1 fixed as usual on the frame 2 at either side of the same, these wings having at the rear and along their entire length, in the sense perpendicular to the frame, movable portions or balancing planes 3 at variable incidence hingedly mounted in a suitable manner on the corresponding stationary portion 1 of said wings.

At the front end of the frame and for a width corresponding approximately to the span across the rear wings a stationary plane 4 is arranged of a penetrating profile without incidence and designed to ensure that the stream lines are brought again into and maintained in the horizontal directon said stream lines exerting then, under more favorable conditions, their action upon the rear plane. At each end of this plane 4 a stationary supporting wing 5 is arranged which has along its transverse edge a movable portion or balancing plane 6 which is hingedly connected with the stationary wing 5 and the incidence of which may be altered at will.

This triangular arrangement of supporting planes has the effect to ensure the automatic stability in all directions, the stability in longitudinal direction being completed by a horizontal rear plane consisting of a stationary portion 7 and of a movable portion 8 of variable incidence.

A rudder 9 is arranged at the rear end.

The invention is essentially characterized by the combination of the elements, which have been described, with a special driving system by means of which these elements co-operate to obtain the result in view of a sure automatic stability and of such an easiness of guiding that even pilots which are not perfectly skilled are sufficient.

This driving system (see specially Fig. 3) comprises a hand lever 10 which is mounted at its lower end in a Cardan joint and carries two stationary bearings 11, 11 from which extend in a horizontal plane the shafts 13, 14 towards the front and towards the rear, said shafts being connected to the horizontal axle of the hand lever by means of cardans 12, 12.

At the free end of shaft 13 a horizontal oscillatable lever 15 is journalled in a movable bearing 16 adapted to slide upon this shaft. The oscillatable lever 15 controls the two balancing planes 6 of the rear wing by means of two vertical connecting rods 17, 17 and of two horizontal rods 19, 19 hingedly connected with the upper ends of the vertical rods 17, 17 by angle irons 18, 18, a two-armed lever 20 mounted on the end of each horizontal rod 19 and a horizontal connecting rod 21 at the upper end of each lever 20 and hingedly connected at the other end to a lever 21 of the balancing planes 6. The shaft 14 is journalled at its free end in a bearing 16^a slidable upon said shaft and the shaft carries an oscillatable transverse lever 15^a which is designed to operate the balancing planes of the rear wings 1 by similar means as have been described for controlling the balancing planes of the front wings.

If the handle 10 is turned in the one or other direction the balancing wings at the front and rear of the aeroplane are simultaneously lowered or lifted through the intermediary of the connecting rod systems described.

In order to make it possible to modify

the initial incidence of the balancing planes, especially for starting or landing, the bearings 16 and 16ª are hingedly mounted on forks 23, 23ª of horizontal axles 24, 24ª to the other ends of which levers 25, 25ª are hinged which, by means of connecting rods 26, 26ª, are connected to a toothed sector 27, each sector meshing with a pinion 28 driven by a hand wheel 29, means for automatically locking said pinions if the hand wheel is not rotated being provided.

The pilot can, by means of this hand wheel 29 and of the intermediary elements described and by altering the inclination of the forks 23, 23ª modify the position in height of the bearings 16, 16ª, without interfering with or interrupting the differential driving of the balancing surfaces by the handle, and lift or lower the balancing planes without modifying their angular position, wherefrom results an identical action for all the balancing planes causing a similar variation of their incidence.

For controlling the longitudinal balancer 8 serves a connecting rod 30 connected to the hand lever 10 by a ball joint, said connecting rod 30 being hingedly connected to a vertical lever 31 which, by wires 32 and 32ª or by rigid bars, is connected to the lever 33 of the balancer 8. The double armed rocking lever 34 mounted upon a vertical axle is connected by wires 35, 35 or rigid bars to the lever 36 of the rudder 9.

Instead of rigid bars, wires might be used for controlling the variations of the incidence at the condition however that a return cable be provided for each separate drive for the balancing planes.

The increase of incidence of the balancing planes at the front and at the rear, obtained by the same rotation of the hand wheel 29 which remains automatically fixed to the selected incidence, permits to increase the supporting power of the planes without the necessity of making the aeroplane rear and it permits, consequently, of ascending in maintaining the aeroplane in the horizontal position. By reducing the output of the engine one makes the aeroplane descend flat, always in the horizontal position and without inclining the head. The facultative increasing and decreasing of the supporting power avoids the dangers of speed changing.

I claim:—

An aeroplane possessing natural stability, comprising in combination, a rear supporting plane composed at either side of the frame of a stationary portion and of a balancing surface of variable incidence, a central stationary plane at the front end without incidence and corresponding to the span across the rear plane, two supporting planes arranged at the lateral ends of said central plane and comprising each a movable portion and a balancing plane of variable incidence, a lever for each balancing plane of variable incidence, a connecting rod connected to each lever, a two-armed transmission lever hingedly connected to the free end of each connecting rod, a horizontal connecting rod at the free end of each transmission lever, a bell crank transmission at the end of each horizontal connecting rod, a vertical connecting rod hingedly connected to each bell crank transmission, a horizontal oscillatable lever hinged to the lower end of each vertical connecting rod, two horizontal shafts on one of which said oscillatable levers are keyed, a hand lever for operating said horizontal shafts, two slidable bearings one on each shaft, pivotable forks one for carrying one bearing and designed to raise or lower said bearings, and a mechanism for controlling the angle of inclination of said forks said mechanism consisting of transmission levers, connecting rods, a toothed sector, a pinion on each shaft and a hand wheel for rotating said pinions.

In testimony whereof I affix my signature.

JOSEPH ALBESSARD.