

## ABSTRACTS OF PATENT SPECIFICATIONS

(Specially abstracted for the Journal by W. O. Manning, F.R.Ae.S.)

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### *Aerodromes*

437,794. *Improved Wind-Direction Indicator for Aerodromes and Analogous Situations.* Hart, E. P., The Girls' High School, Pretoria, Transvaal. Dated April 26th, 1935. No. 12,581.

This indicator consists of a number of radial illuminants symmetrically extending from a common centre and an arrow-shaped or similar illuminant at the outer end of each radial illuminant. There is also a group of illuminants arranged in the form of a ring round the common centre and adopted to project light rays inwardly. Reference is made to specification No. 421,876.

### *Aerodynamics*

437,885. *Improvements in or relating to the Streamline Formation of Bodies for Land Vehicles and Aircraft.* Tennant, W. J., 111/112, Hatton Garden, London, E.C.1. Dated March 1st, 1934. No. 6,605.

In the case of bodies intended for aircraft or motor vehicles it is pointed out that owing to practical considerations, such as the necessity of providing view for the driver and also the providing of mudguards, etc., that the optimum streamline body cannot be used. It is proposed, therefore, to reduce the resistance of such imperfectly streamlined vehicles by the delivery of pressure air at the points of disturbance, the air being tapped through conduits opening at zones of pressure directly on the surface of the body.

438,037. *Improvements relating to the Propulsion of Aircraft.* The Federated Engineers, Ltd., 3, Central Buildings, Westminster, London, S.W.1, and Brackenbury, E. W., 13, Victoria Street, Westminster, London, S.W.1. Dated May 9th, 1934. No. 14,007.

It is stated that when a fluid stream is directed substantially radially from the surface of a body it not only causes a tractive effort, but also clings to the

surface of the body, hence energising the boundary layer and reducing the resistance. It is therefore proposed to construct an aeroplane having a motor-driven blower collecting air from an inlet facing forward and delivering this air by means of internal ducts so that it emerges radially from the front of the fuselage and also from the leading edge of the main plane.

### **Aeroplanes—Construction**

430,662. *Improvements in or relating to Pusher Airscrew Aeroplanes.* Baynes, L. E., of E. D. Abbott, Ltd., Farnham, Surrey. Dated Dec. 22nd, 1933. No. 36,112.

The aeroplane described is a high wing monoplane in which the wing is placed on top of a normal fuselage. The nose of the wing is faired into an enclosed cabin forward and the engine is carried on a structure above the wing. The engine is arranged as a pusher, the propeller being placed at about the trailing edge of the wing. The arrangement therefore permits the propeller to be arranged lower in the aircraft than is usual on such machines and this is claimed as the advantage of the arrangement.

430,331. *Improvements in or relating to the Construction of Aeroplanes.* The Fairey Aviation Co., Ltd., Cranford Lane, Hayes, Middlesex, and Hollis-Williams, D. L., Hillside, Swakeley's Road, Ickenham, Middlesex. Dated Oct. 23rd, 1932. No. 36,474.

In order to combine the advantages of high and low wing monoplanes it is proposed to construct a low wing monoplane with the centre section arched upwards, so that the wing may meet the upper part of the fuselage. Constructional arrangements are described and the arrangement may be applied to the lower wing of biplanes.

428,225. *Improvements in Metal Framework for Aircraft.* A.T.S. Co., Ltd., and Wylie, H. N., both of 3/4, Clement's Inn, Strand, W.C.2.

In order to stiffen metal covering for the wings, fuselages, hulls, etc., of aircraft, it is proposed to attach to the covering a longitudinal member spaced from the covering and braced to it by diagonal bracing, the widths of the longitudinal and of the bracing respectively being less than the depth of the member.

438,327. *An Improved Method of Covering Aircraft Components.* The Fairey Aviation Co., Ltd., Cranford Lane, Hayes, Middlesex, and Pearce, H. L., 103, Studland Road, Hanwell, London, W.7. Dated April 25th, 1935. No. 12,477.

For the purpose of covering aircraft planes with fabric it is proposed to wind the upper and lower booms of the ribs with fabric to which the covering fabric is sewn together with a reinforcing strip. In order that the seams may have a smooth surface they are then covered with a narrow strip of cellulose acetate reinforced with fabric and the wing is then treated with solvent varnish.

### **Aeroplanes—General**

430,421. *Improvements relating to Illuminating Devices for Aircraft.* Harley, M. C., The Red House, Cranford, Middlesex. Dated Dec. 14th, 1933. No. 35,258.

The lamp proposed has a parabolic reflector in front of which a special diffusing arrangement causes a spread of the beam, while the lower half of the beam is allowed to emerge substantially parallel. The lamp is arranged so that it can be folded into the aeroplane, and also so that its inclination relative to the aeroplane can be controlled by the pilot in flight. The mechanism for this is

described and consists of a quadrant designed for rigidity operated by means of a Bowden wire control.

### **Aircraft—General**

437,787. *Propeller Drive for Wingless Aircraft.* Paul Merz, Luzernerring 136, Bale, Switzerland. Convention date (Switzerland), March 13th, 1934.

This specification describes an aircraft of rectangular plan form having a section resembling an aerofoil arranged to be driven, supported and stabilised by means of rowing propellers. These latter resemble, approximately, normal propellers, and are arranged in pairs on opposite sides of the aircraft on vertical axes so that half of the propeller works in a lateral cell in the body. The other half is exposed on the outside of the body and it is this part which is stated to act as claimed above. Blade incidence is adjustable.

436,099. *Improvements in or relating to Aircraft and Other Vehicles and the Like.* Ramsbottom, J. E., Lockspeiser, B., and Stewart, C. J., all of the Royal Aircraft Establishment, South Farnborough, Hants. Dated April 7th, 1934. No. 10,549.

This specification deals with de-icers of the type in which a liquid known to lower the freezing point of water, such as ethylene glycol, is forced by pressure through a permeable covering situated on the leading edge of the wing, or in other positions that it is desirable to protect. The liquid under pressure may be carried in a pierced rubber tube, and so distributed within the permeable covering. A similar method of protection is described as suitable for de-icing propellers and their hubs or spinners.

### **Airscrews**

438,317. *Improvements in or relating to Means for Actuating the Rotatable Blades of Blade Wheels.* Voith, W., Voith, H., and Voith, H., Heidenheim, ander Brenz, Wurtemberg, Germany. Convention date (Germany), March 26th, 1934.

This specification is concerned with rotary propellers, described as blade wheels, in which the blade axes are approximately paralld to the axes of the wheel. In order to control these blades it is proposed to use a member which is centrally located when the blade inclination is zero, but is eccentrically adjustable and which revolves with the blade wheel, is pivotally connected for each blade a rod which is longitudinally slidable in an oscillatable guide the pivotable point of which is fixedly located upon the wheel and from which the angular movement of the blade is obtained.

438,332. *Improvement relating to Aircraft.* Houston, R. G., 9, Amity Street, Dingle, Liverpool, 8. Dated May 10th, 1935. No. 13,776.

This invention relates to aircraft and its object is the provision of a device which surrounds the propeller of the craft and mechanically controls the air current both in front and at the rear of the propeller for the purpose of minimising drone, cooling of the aero engine and speed accelerations and retardations.

438,295. *Improvements in or relating to Cylindrical Propellers.* Mellersh-Jackson, L., of Haseltine, Lake and Co., 28, Southampton Buildings, Chancery Lane, London, W.C.2. Dated Dec. 6th, 1934. No. 35,082.

The type of propeller proposed consists of a box of approximately circular section having a number of slots in its circumference through which project a number of blades. As, in the interior of the box, the blades are attached to an eccentric centre, the blades will be caused to project from or be withdrawn into

the box on rotation and can be used for propulsion. The eccentric centre can be adjusted so as to modify the direction of the action of the propeller and the circular box can be made watertight.

### **Autogiros**

435,818. *Improvements in or relating to Helicopter and Rotating Wing Aircraft.* Coats, A. G., Gloucester House, Park Lane, London, and Hafner, R., Manthergasse 47, Vienna, 13, Austria. Dated March 29th, 1934. No. 9,867.

In the case of rotors with flapping blades it is stated to be desirable that the blades should be pivoted in such a way that the flapping axes intersect one another and also the axis of rotation of the hub member. In order to effect this in the case of a three-bladed rotor, the blade arms are attached to a fork with unequal projections which lie within and without each other alternately, and which bear on pins extending radially, the pins being supported by an external ring. The blades may be provided with means for varying their inclination controlled by means of radius rods operated by means of a spider arranged about the hub.

### **Bombs and Ballistics**

438,300. *An Improved Bomb-Aimer's Windscreen.* The Fairey Aviation Co., Ltd., Cranford Lane, Hayes, Middlesex, and Ebbutt, C. G. W., Wallingbourne, Manor Park Drive, North Harrow, Middlesex. Dated Dec. 14th, 1934. No. 35,951.

In order to protect the bomber from air currents he is provided with a windscreen formed by two or more pieces of transparent material arranged so as to have an open slot between them. The whole arrangement is mounted on a rotatable frame, rotatable by the bomber and so arranged that the frame may be rotated to a position where the slot is covered by a shield, preventing air from entering the cockpit.

436,069. *Improvements in or relating to Gun Mountings.* Boulton and Paul, Ltd., Riverside Works, Norwich, Norfolk; North, J. D., Hill House, Eaton Hill, Norwich, Norfolk; and Hughes, H. A., Westfield, Plumstead Road, Norwich, Norfolk. Dated Feb. 2nd, 1933. No. \*3,204.

The gun mounting described consists of a revolving turret partially embedded in the nose of an aeroplane fuselage. It is entirely covered with a transparent material, but has a vertical slot to permit the gun to be fired upwards or downwards. Traversing is done by moving the gun laterally, which action opens and closes valves connected with a compressed air motor turning the whole turret, so that the turret follows the gun. Types of driving motor and methods of operation are described and the driving mechanism may be used in conjunction with cylinders containing oil.

### **Control of Aircraft**

438,020. *Apparatus for Automatically Regulating the Course or Speed of an Aircraft.* Siemens-Apparate und Maschinen-Gesellschaft Mit Beschraenkter Haftung, 4, Askanischer Platz, Berlin, S.W.11, Germany. Convention date (Germany), Feb. 3rd, 1933.

It is proposed to regulate the course or speed of an aircraft by means of an arrangement for measuring deviations of the craft from the desired course or speed and a primary piston moved in accordance with the deviations measured thereby, the movements of such primary piston being damped so as to take place at a speed proportional to the rate of change of such deviations, thereby setting up a fluid pressure proportional to such rate of change, the pressure being employed to control the movements of a secondary piston. The movements of

the two pistons are applied jointly to control a servo motor operating on the appropriate control surface of the craft. There may be a further control proportional to the acceleration with which the deviations change.

438,021. *Apparatus for Automatically Regulating the Attitude, Course or Speed of an Aircraft.* Siemens-Apparate und Maschinen-Gesellschaft Mit Beschraenkter Haftung, 4, Askanischer Platz, Berlin, S.W.11, Germany. Convention date (Germany), Dec. 19th, 1933.

This specification is similar in many ways to 438,020 (above), but claims that the means for measuring the angular velocity of the craft about the axis comprises a spring enclosed gyroscope, and also an arrangement by which one of the pistons contains the cylinder enclosing the other piston.

431,648. *Improvements in or relating to Control Mechanism for Aeroplanes.* Baynes, 144, Cromwell Road, London, S.W.7. Dated Jan., 1934: No. 1,193.

In order to obviate the use of the rudder bar on aeroplanes it is proposed to use a control lever of the normal type, but carrying on its upper end two concentric control wheels mounted one behind the other and operating the rudder and ailerons respectively. With this arrangement the rudder and ailerons can be operated apart by using one hand on each wheel, or together by gripping both wheels at once. Fore and aft movement of the stick operates the elevators as usual.

431,328. *Improvements in Piloting Controls for Aircraft.* Bendix Aviation Corporation, 105, West Adams Street, Chicago, Illinois, U.S.A. Convention date (U.S.A.), Oct. 6th, 1932.

It is proposed to combine the action of manual and automatic control on the controls of an aeroplane so that such control surfaces as are rarely operated in flight are operated automatically, whilst those controls which are frequently operated in flight may at any time be controlled manually in addition to the automatic control. The preferable arrangement is that the rudder and elevator should be so arranged that manual operation cannot be used unless the automatic control is cut out, while in the case of ailerons manual control may be superimposed on the automatic.

435,888. *Automatic Aero-Dynamic Stabiliser for Aeroplanes.* Bembery, O. E., 28, Rue Emile Meniev, Paris (Seine), France. Convention dates (France), Oct. 12th, 1933, and July 4th, 1934.

This specification describes a modification to an arrangement described in Patent No. 422,493. The stabilisation is carried out by means of two wind vanes which are mounted near the wing tips of the aircraft. These are so connected by a link and lever motion that when they come into action owing to the inclination of the aeroplane the effect of one of them is large and, of the other, small. The movement of the vanes is coupled to the controls. The vanes may consist of a cruciform arrangement of planes connected by a rod to a similar tail. The planes may differ in angle from the tail, and the tail may be weighted.

### **Engines**

431,687. *Improvements in and relating to Motor Driven Propeller Units.* Scott, B. D., Camp, Miserden, nr. Stroud, Gloucestershire. Dated Jan. 8th, 1934. No. 689.

In order to avoid the torque reaction on aircraft it is proposed to use two concentrically mounted propellers running in opposite directions driven by a special type of internal combustion engine. This engine has multiple cylinders mounted so that each pair of cylinders has a common combustion chamber, and there are two crankshafts turning in opposite directions. From this engine the

propellers are driven by gearing. Engine auxiliaries are driven by a coupling rod device and the exhaust gas operates an air blower, air from which may be used for cooling or supercharging.

430,443. *Improvements relating to the Cooling of Air-Cooled Radial Cylinder Engines on Aircraft.* Siemens and Halske Aktien-Gesellschaft, Berlin-Siemensstadt. Convention date (Germany), Jan. 28th, 1933.

In the case of radial air-cooled engines fitted with a cowl of the Townend type it is proposed to conduct the cooling air to each cylinder through a separate passage, the air being conducted round each cylinder through a jacket. The openings in the front of the cowling are rectangular in section, arranged with the major axis radial, the openings in the rear of the cowling are also rectangular, but the major axis is circumferential, the section of the passage changing gradually from one to the other. The passages are so proportional that the cooling air has the same velocity at the entry and outlet as the outside air, allowance being made for temperature increase. It is claimed that the arrangement prevents turbulence.

435,879. *Flexible Mountings for Aircraft Power Units.* Armstrong-Siddeley Motors, Ltd., Wylie, H. N., and Gay, A. R. B., all of Armstrong-Siddeley Works, Park Side, Coventry. Dated May 22nd, 1934. No. 15,241.

This specification describes a method of flexibly mounting aircraft engines of the radial type. It is proposed to attach the engine to a support which is of built up box section, the circular engine mount carrying a flanged ring in which rubber is fitted so that the engine is supported on a spigotted rubber mount. The bolts are carried through clearance holes in the flange and have rubber bushings to absorb torque. In certain cases springs may be substituted for the rubber and a case is described where flexibility between the bolt and the mounting is secured by means of freely turning steel rollers. Modifications of the arrangement are described.

### **Flying Boats**

435,712. *Improvements in and relating to Lateral Stabilising Fins for Flying Boats.* Saunders-Roe, Ltd., Knowler, H., and Farrow, J. R., all of Columbine Works, Medina Road, East Cowes. Dated April 21st, 1934. No. 12,056.

It is proposed to arrange stabilising stub wings for flying boats so that the leading edge of the stub wing lies approximately parallel to the hull wave, the precise angle, stated to be about  $15^{\circ}$ , to be ascertained in a tank test on a model hull. The fins are to be of streamline section and are to have little or no positive angle of incidence when the machine is in flight at the usual cruising speed. The trailing edge of the stub wing may be parallel to the leading edge, or may have other forms and the wing tips may be rounded.

### **Helicopters**

437,910. *Improvements in or relating to Aircraft.* Oehmichen, E. E., Rue des Graviers, Valentigney (Doules Department), France. Convention dates (France), Oct. 23rd, 1933, and Oct. 31st, 1933.

This invention is claimed to describe a navigation apparatus with static stabilisation and high coefficient of security, which is capable of effecting vertical, horizontal or inclined flight. The static stabilisation and the security are obtained by providing the apparatus with one or more light wing envelopes in the form of tapered bodies of great penetration, rigid or not, filled with air and surmounting a motor propelling mechanism to which it is attached indeformably, the centre of volume of this wing envelope or of the whole of the wing envelopes being



above the general centre of gravity of the apparatus and on the vertical of this same centre when the apparatus is in normal flight of translation.

438,111. *Improvements in Rotary Wings for Aircraft.* Asboth, A., Nurnburgerstrasse 53/55, Berlin, W.50, Germany. Dated March 12th, 1934. No. 7,746.

In the case of rotary wing machines it is usual to hinge the blades of the lifting rotor in the neighbourhood of the hub. Owing to certain stated difficulties it is proposed to construct these blades in several parts, the parts being connected by semi-rigid flexible elastic or resilient couplings.

### **Jet Propulsion**

431,646. *Improvements in or relating to the Propulsion of Solid Bodies in Fluid Media.* Coanda, H., 10, Rue Bardin, Clichy (Seine). Dated Jan. 8th, 1934. No. 682/34.

This specification relates to a method of jet propulsion in which the jet of air may be produced either by a motor-driven fan or a flame. In the case of the flame, air is introduced and is allowed to expand in a tapered chamber. On issuing from this chamber it is deflected backwards by an aerofoil shaped member. Modifications of the apertures for air entry are described and in the position of the aerofoil. The arrangements for the fan-produced jet are similar.

### **Miscellaneous**

438,353. *Improvements in Floating Stations.* Creed, F. G., 38, Outram Road, Addiscombe, Croydon. Dated March 15th, 1934. No. 8,238.

It is proposed to construct floating platforms for aircraft in either T or isosceles triangle form, each supported by three cylindrical floats arranged vertically. Extensions to the platform are hinged to the main platform, the other end being supported by a similar float.

### **Undercarriages**

438,165. *Shock Absorbing Means for the Undercarriages of Aircraft.* Elektronmetall G.M.B.H., Stuttgart-Bad, Connstatl, Germany. Convention date (Germany), Dec. 16th, 1933.

In order to absorb the shock of an aeroplane alighting it is proposed to use the resilient properties of tubes strained in torsion. The shock is transmitted to one end of the tube via a crank, the other end of the tube being fixed. The tube may lie along the fuselage or the wing or may form a portion of the undercarriage. Multiple torsion tubes may be used, arrangements being made for them to come into action one after another by means of crank elements normally clear of the operating member, but which contact when the previous torsion members are under sufficient stress.

438,296. *Improvements relating to Retractable Aircraft Undercarriages.* Dowty, G. H., 17, Lansdown Crescent, Cheltenham. Dated Dec. 7th, 1934. No. 35,231.

This specification describes a retractable undercarriage which is, normally, intended to retract the wheel forwards. There is a hinge on the front spar of the aeroplane wing which carries a vertical retracting jack which extends upwards. The lower projection of the jack carries a normal shock absorbing apparatus and the wheel. There is also a diagonal strut from a position near the wheel to the rear of the wing. When the jack is operated to retract the lower portion of this strut swings upwards in a radius, the jack at the same time shortening the apparatus so that in the retracted position the jack and the retracting apparatus is horizontal. The jack may be used as part of the shock absorbing apparatus.