

ABSTRACTS OF PATENT SPECIFICATIONS.

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

Abstracts of Patent Specifications received by the Society are published in the Journal. It should be noted that these abstracts are specially compiled by Mr. W. O. Manning, F.R.Ae.S., for the Journal and are only of those actually received and subsequently bound in volume form for reference in the library. These volumes extend from the earliest aeronautical patents to date, and form a unique collection of the efforts which have been made to conquer the air.

The Council accept no responsibility whatever for the accuracy of the abstracts and in any case of doubt the full patent can be consulted when necessary in the library of the Society.

These abstracts are compiled by permission of the Controller of His Majesty's Stationery Office. Official Group Abridgments can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, either sheet by sheet as issued on payment of a subscription of 5s. per group volume or in bound volumes 2s. each, and copies of full specifications can be obtained from the same address, price 1s. each.

AEROPLANES—CONSTRUCTION.

450,083. *Improvements in or connected with Means for Attaching Fabric Coverings to the Metal Structure of Aircraft Frames.* Short Bros., Ltd., and Clark, A. W. C., both of Seaplane Works, Rochester, Kent. Dated March 14th, 1936. No. 7,741.

The object of this insertion is to attach fabric to the structure so that neither the warp or weft is severed but also to enable the surface at the attachment to be given a smooth finish. The attachment means consists in forming the structure with a series of grooves in line with each other leaving posts between the grooves flush, thus forming flat bridge pieces and providing a fabric retaining device adapted to pass under the bridge pieces and to lie within the grooves. The grooves may be closed at the bottom or they may be openings into which parts of the fabric may be depressed. The fabric is held down by a tool into these grooves while a pointed wire skewer is traversed through the grooves when the tool is removed. Afterwards a strip of adhesive can be applied over the exposed skewer.

456,596. *Improvements relating to the Securing of Short Members to a Wooden Batten by Means of Staples.* Calver, B. G., 52, Linver Road, London, S.W.6. Dated July 15th, 1935. No. 20,214.

In order to secure two sheet members, such as three-ply wood, together at an angle to each other, it is proposed to use a batten in the corner and to fix the sheets to this with machine drawn staples, which may or may not be clenched. Glue may also be used. Various joints made on this principle are described, some with two battens and others in which the sheets are secured by staples in grooves in the batten.

454,198. *Improvements in and relating to Tail Skids and Tail Wheels for Aircraft.* Elektronmetall G.m.b.H., 26, Stuttgart Bad Cannstatt, Germany. Convention date (Germany), Feb. 19th, 1935.

This is a skid or tail wheel for aircraft with a shock absorber built into the back part of the fuselage so as to rise rearwardly and a tail skid or tail wheel element, the vertical swinging axis of which is nearly vertical or inclined at a small angle towards the front and in which the support bearing is connected with the lower end of the shock absorber so as to move in a straight line in the direction of the axis of the shock absorber.

AEROPLANES—GENERAL.

451,879. *Improvements in or relating to Aircraft and other Vehicles.* Ramsbottom, J. E., Lockspeiser, B., and Stewart, C. J., all of the Royal Aircraft Establishment, South Farnborough, Hants. Dated May 8th, 1935.

This specification refers to the prevention of ice formation on aeroplane wings, and consists of a permeable nose covering to the wing through which a suitable liquid, such as Ethylene Glycol can percolate. The liquid is led to the nose by tubes, holes in which carry absorbent threads which pass through the apertures and act as wicks, thus distributing the liquid from the interior of the tube to the absorbent covering. Reference is made to Specification No. 10549 and Serial No. 56099.

453,030. *Improvements in or relating to Aerofoils.* Muschler, F., Benville Township, Morris County, New Jersey, U.S.A. Dated Oct. 11th, 1935. No. 28,160.

This specification describes what is claimed to be an improved aerofoil of the type in which the leading edge is substantially semi-circular in plan. The trailing edges converge in one or more points and in which a pusher propeller is mounted at each of sail points. The machine has a plan form of low aspect ratio of what is described as raindrop shape, with its greatest dimension parallel to the line of flight.

453,825. *Method of and Means for Warming the Wings and Other Parts of Aeroplanes.* Schmid, F., Eiken, Aagan, Switzerland. Dated June 28th, 1935. No. 1,257.

It is stated that it is inadvisable to introduce exhaust gases into a wing for the purpose of warming it owing to the effect of these gases on the material of which a wing is constructed. It is proposed, therefore, that air warmed by passing through a chamber, through which the exhaust pipe also passes, shall be used for this purpose. Timing arrangements may be used for increasing the heat transfer, and the hot air is conducted through the wing by a pipe suitably pierced with holes for its escape. The end of the pipe is taken to the wing tips and the orifice is turned rearward, so as to increase the flow through the pipe. Other portions of aircraft may be warmed in the same way.

455,023. *Improved Aeroplane having a Variable Lifting Surface.* Gerin, J., 24, Rue de la Tourelle, Boulogne-sur-Seine (Seine), France. Convention date (France), April 7th, 1934.

This specification refers to aeroplanes in which the wings are increased in depth for low speed landings by means of flexible movable surfaces which may be wound on drums. It is proposed that the operating drums be driven from a reversible motor by means of free wheels, or the like, so arranged that the free wheel driving the operating drum for the flexible surface is actuated in its free direction and with a certain lead when the flexible surface is spread out, the free wheel for the cable drum being then actuated in the driving direction.

454,820. *Improvements in or connected with Apparatus for Discharging Fuel or other Liquid from Aircraft.* Short Bros. (Rochester and Bedford), Ltd., and Gouge, A., both of Seaplane Works, Rochester, Kent. Dated Dec. 19th, 1935. No. 35,206.

This is a jettison valve intended primarily for the fuel tanks of aircraft. It consists of a mushroom valve in the tank which is assisted to keep on its seat by the tank fuel pressure. The pipe leaving the tank, into which pipe the valve discharges when open, is bent near the tank so as to permit the valve stem to emerge from the tube. The valve is opened by a hand wheel and screw gear. A special packing seals the valve stem hole when the valve is open.

454,388. *Improvements relating to Aeroplanes.* Griffen, G., 56, Ludgate Hill, London, E.C.4. Dated April 1st, 1935. No. 10,094.

This specification describes an aeroplane of the Burnelli type in which the wing has a central section of the convex aerofoil contour of sufficient depth to accommodate passengers and outer wing sections tapering in plan and depth, but having substantially the same chord at the root and the same upper camber at the root as, but considerably less depth than, the centre section whereby a wing is obtained having a continuous upper surface.

454,556. *Improvements relating to Aircraft.* MacDonald, R. (Miss), 81, South Audley Street, Mayfair, London. Dated March 27th, 1935. No. 9,544.

In the case of aircraft wings it is proposed to add an auxiliary wing of triangular form which is accommodated beneath, inside or on top of the main wing, this auxiliary being attached to the fixed wing by a ball joint near the tip. It can be drawn out rearwardly by mechanism in the fuselage, can have its incidence adjusted, and a slot may be formed between the main wing and the auxiliary.

454,096. *Improvements in or relating to Aeroplanes.* Philippichs, S., 200, Royal Exchange, Manchester, Lancaster. Dated March 23rd, 1935. No. 9,081.

The proposed aeroplane is provided with supporting surfaces and air current producing means so arranged that the currents flow beneath and parallel to the plane of the surfaces to produce lift without the employment of translation. The air currents may be produced by fans, or mechanical or electric draught-producing means, etc.

454,193. *Improvements in Aircraft.* Gerin, J., 24, Rue de la Tourelle, Boulogne-sur-Seine (Seine), France. Convention date (France), Nov. 17th, 1934.

The aeroplane described has variable wings of flexible construction which can be operated by drums on which the flexible surfaces can be wound. It also has a fuselage, the transverse ribs of which have a horizontal axis the length of which continually increases from the front to the trailing edge of the empennage, while the vertical axis varies for giving an aerodynamic profile.

AEROPLANES—UNDERCARRIAGES.

452,324. *A System of Retractable Landing Gear for Aeroplanes.* Société d'Inventions Aeronautiques et Mécaniques S.I.A.M., 1, Route des Alpes, Fribourg, Switzerland. Convention date (France), Jan. 12th, 1935.

This is a retractable chassis of the type which folds backwards into the wing. In the extended position there is a shock-absorbing strut on each side of the wheel and a diagonal member inclined upwards and forwards containing the retracting jack, and a further directing bar hinged to the wing and to the shock-

absorbers. On operation, the shock-absorbing struts break above the shock-absorbers and the wheel retracts backwards as stated.

453,797. *Improvements in Brake-Operated Mechanism for Aircraft.* Bendix, Ltd., King's Road, Tyseley, Birmingham, and Hall, P. E., of the same address. Dated July 10th, 1935. No. 19,681.

A cable from a hand control is coupled to one end of a lever pivoted at its other end to a cage secured to the machine. At an intermediate position on the lever are two coaxial pulleys round which cables from the foot brakes are led in opposite directions. Their ends are secured to points on opposite sides of a rocking bar pivoted on the cage and coupled to the rudder bar so that the two move together. To apply the brakes equally the cable from the hand control is tensioned, thereby moving the lever carrying the pulleys and applying both brakes equally. If the rudder bar is operated the rocking bar moves with it and the anchorage for one brake cable is moved towards the pulleys while the other is moved away, so that the force applied to one brake is increased and that applied to the other is diminished. When the hand control is off there is sufficient slack in the cables to permit of a normal movement of the rudder bar.

450,929. *Improvements in or relating to Retractable Undercarriages for Aircraft.* The Fairey Aviation Co., Ltd., Cranford Lane, Hayes, Middlesex, and Ordidge, F. H., 24, Carlton Avenue, Cheadle Hulme, Cheshire. Dated July 9th, 1935. No. 10,413.

In this folding undercarriage the wheel is arranged to fold backwards into the wing. The wheel is carried in a fork attached to a single tube vertical member containing the shock absorbing gear. This tube carries a member in which is a diagonal slot. Working on a pin sliding in this slot is a jack pivoted on the shock-absorbing tube, and a further rigid radius member hinged rearwardly in the plane. On admitting fluid below the jack piston the chassis is retracted into the wing.

450,771. *Novel or Improved Method of and Means for Controlling the Movement of Aeroplanes when Landing or Travelling on Land.* Colbourne, J. H., "Wear Giffard," Cliff Hill, Warwick. Dated Jan. 29th, 1935. No. 2,844.

This specification describes a differential braking arrangement for aircraft. In this case, instead of interposing the differential leverage device between the brakes proper and the brake pressure originating device, it is situated at one end of the system to function as a reaction anchorage. The arrangement has a lever with a variable fulcrum point, which fulcrum point slides in a curved slot. Other arrangements which are similar mechanically are also proposed.

450,922. *Improvements relating to Landing and Taking-off Gear for Aircraft.* Beadon, R. R. C., The Glen, Valley des Vaux, St. Helier, Jersey, Channel Islands. Dated Feb. 10th, 1936. No. 4,037.

The chassis proposed is said to comprise the known principle of assisting aircraft into the air by a vaulting action similar to that employed by birds. It is therefore proposed to fit the aeroplane with one pair of eccentric running wheels so that when taking off, the front of the machine is raised and lowered. The wheels may be of elliptical shape mounted at the point of intersection of the major and minor axes.

456,632. *Landing Gear for Aeroplanes.* Aeroplanes Morane-Saulnier Societe Anonyme de Constructions Aeronautiques, 3, Rue Volta, Puteaux, Seine, France. Convention date (Germany), March 22nd, 1935.

In this retractable undercarriage, the wheel is carried by three struts connected to the aeroplane, one of which is jointed about the centre. When the jointed

strut is folded the chassis is retracted. The folding is carried out by a jack mounted on and carried by the jointed strut. It is positioned over the joint at right angles to the strut, one end of the jack forming a block to which the strut halves are hinged. The jack plunger is fitted with links engaging with pins on the strut halves some little way out so that when the jack is extended by admitting fluid under pressure the strut is folded and the chassis retracted. Various modifications in which similar jack arrangements are used for retraction are described.

455,384. *Improvements relating to Retractable Undercarriages for Aircraft.* Dowty, G. H., 17, Lansdown Crescent, Cheltenham, Gloucester. Dated April 23rd, 1935, No. 12,231, and May 25th, 1935, No. 15,307.

In this retractable undercarriage the jack carries a fixed member on which the part actuated by the jack moves. This member can be a structural part and four of the chassis members are anchored to the movable part actuated by the jack. On the jack being operated this member is moved along and in moving it carries the rest of the undercarriage to its folded position.

455,932. *Improved Means for Operating Aircraft Brakes.* Bendix, Ltd., King's Road, Tyseley, Birmingham, and Hall, P. E., of the same address. Dated May 15th, 1935. No. 14,178.

In aircraft brakes, where means are provided for steering on the ground as well as braking, it is proposed to use two hydraulic cylinders, or relay valves, mounted side by side with parallel axes in a casing. Rollers carried on pivoted links bear on the valves or plungers, and these are operated by a thrust member operating slideably between and opposite to the rollers. This operating member can be worked in a parallel direction, giving equal operation, or it may be moved sideways, giving differential operation.

456,139. *Improvements in Undercarriages for Aeroplanes.* Heller, M., 33, Burggasse, Vienna, VII, Austria, and Tippelt, A., 37, Grune Torgasse, Vienna, Austria. Dated May 3rd, 1935. No. 13,229.

The proposed arrangement consists in an auxiliary hollow lifting plane suspended from the aeroplane body by means permitting displacement of the plane relative thereto which is controlled by cushioning arrangements between the plane and the aeroplane itself. This plane may be fitted with boat bodies which serve as supports. It is also provided with frames fitted with wheels, endless tracks, or other alighting means, all of which are adopted, when bearing against a support, to maintain the auxiliary plane in its proper angular position.

454,279. *Improvements relating to Tail Wheels and the Like for Aircraft.* Dowty, G. H., Arle Court, Cheltenham, Gloucester. Dated April 17th, 1935. No. 11,917.

This specification describes a retractable tail wheel. The fork carrying the wheel is supported resiliently and it can be retracted by angular movement about the axis of a bearing which forms the anchorage of the mounting. Further, the wheel and fork may be mounted pivotally for retraction by swinging about a preferably horizontal and transverse axis in the fuselage of the aeroplane and means for effecting the desired movements mounted on the unitary structure. Thus a jack used for this purpose is carried by the tail wheel structure.

AIRCRAFT CONSTRUCTION.

453,213. *Improvements in Resilient Connections and Joints.* D'Albay, J., 12, Rue Gustave-Dore, Paris, France. Dated Nov. 29th, 1934. Nos. 34,333 and 34,334.

This arrangement relates to resilient connections and joints where a resilient element made of rubber and arranged between two members movable relating to each other rolls without sliding when a displacement occurs between them. It is proposed that the opposed surfaces are not parallel at the place where the resilient rubber element has an oblong cross section so as to provide a device of variable flexibility. The resilient member is combined with others, the relative displacement of which not only cause the resilient member to roll, but also cause an increase of its diameter.

452,213. *Improvements in Aircraft.* Martin, J., Martin's Aircraft Works, Higher Denham, Uxbridge, Middlesex. Dated Feb. 18th, 1935. No. 5,172.

The proposed aeroplane is of monoplane type and has the engine mounted in the upper part of the fuselage. The occupants are seated in the forward portion of the fuselage and the engine shaft passing over their heads drives a tractor propeller. It is claimed that this arrangement permits easy access to the fuselage, protects the propeller and prevents the machine being tipped on its nose.

450,729. *Improved Structure of Wings or Other Parts of Aircraft.* Aeroplanes Morane-Saulnier Société Anonyme de Constructions Aeronautiques, 3, Rue Volta, Puteaux, Seine, France. Convention date (Germany), Aug. 21st, 1934.

The aeroplane wing structure proposed consists of a main spar and an auxiliary spar located some little distance apart, the first spar being attached by at least two points and the other attached at one point only. These two spars are connected together by a number of rigid members which are arranged in plan form, as in warren bracing. It is intended that the main spar takes the bending moment forces on the wing, while the auxiliary spar and the accompanying structure stiffen the structure in torque. Various modifications of the arrangement are described, some having the auxiliary spar and its bracing duplicated, there being an auxiliary spar on each side of the main spar.

451,241. *Improvements in or connected with the Construction of Wings for Aircraft.* Short Bros. (Rochester and Bedford), Ltd., and Gouge, A., Seaplane Works, Rochester, Kent. Dated Feb. 2nd, 1935. No. 3,443.

It is proposed to use a metal spar of approximately rectangular cross-section, and to mount within it a tank to contain, say, petrol. This tank can extend along the spar for a distance depending on the desired capacity, and the baffle plates in the interior of the tank are arranged to transmit loads within the spar itself by means of an external diaphragm web forming a continuation of the diaphragm in the tank and attached to the surrounding spar.

452,726. *Improvements in the Structure of Fuselages, Wings and Other Bodies of Aircraft.* Vickers (Aviation), Ltd., and Wallis, B. N., both of Weybridge Works, Byfleet Road, Weybridge, Surrey. Dated Feb. 27th, 1935. No. 6,254.

This specification relates to the geodetic type of construction and it is proposed that both sets of the geodetic members are continuous from one longitudinal member to the next, they being recessed at each inter-section so that the two sets can fit into each other. Generally the geodetic members are of greater depth than width and in order that they may fit into each other they are recessed to half their depth, one from the inner edge and the other from the outer. At the inter-section they are secured by means of riveted angle plates. Further, in the case

of a fuselage it is stated that it is advantageous to arrange one of the longitudinal members at the extreme top and one at the extreme bottom of the body and to arrange the remainder one at each side of the body in a plane at right angles to that containing the upper and lower members.

452,516. *Improvements in or relating to the Reinforcement of Stressed Skin Structures such as Monocoque Fuselages, Hulls, Wings and the like Components of Aircraft.* Gerard, I. J., Heath Ridge, Shortheath Road, Farnham, Surrey. Dated Feb. 28th, 1935. No. 6,404.

In the case of hollow metal structures with smooth external surfaces it is proposed to stiffen these surfaces with internal tubular stiffness. These may be of any desired section, circular, square, etc., and they may be tapered. They may be attached by rivets, spot welding, etc. They may be formed separately or formed integrally with the sheets.

AIRSCREWS.

452,282. *Torsional Vibration Absorber.* G. and J. Weir, Ltd., Holm Foundry, Cathcart, Glasgow, and Bennett, J. A. J., of Genista, Newton Mearns, Renfrewshire. Dated Oct. 1st, 1935. No. 28,392.

In order to reduce the amplitude of torsional vibrations in propellers, it is proposed to use a propeller wherein link means pivoted to the shaft about an axis perpendicular to the shaft are connected to each blade by a pivot whose axis is skewed relatively to the shaft axis and wherein the projections of both said pivot axes on a plane at right angles to their common perpendicular enclose an acute angle, the length of the link means being small relative to the radius of gyration of the blades.

455,688. *Propulsion Means for Watercraft and Aircraft.* Sanders, C., Bolderweg 59, Derr Hdder, The Netherlands. Convention date (Holland), Jan. 20th, 1934.

This specification describes a flapping blade propeller which is arranged symmetrically about a longitudinal axis, the blade having a flapping movement about a transverse axis, a lateral tilting movement or these movements simultaneously.

454,983. *Improvements in or relating to Aircraft and Propulsion Means Therefor.* de Havilland, G., and The de Havilland Aircraft Co., Ltd., Hatfield Aerodrome, Hatfield, Herts. Dated July 9th, 1935. No. 19,636.

In the case of airscrews for aircraft it is proposed to combine the use of variable pitch airscrews with a variable speed gear, so that the speed ratio between the engine and propeller can be varied as well as the propeller pitch. It is proposed to use a high gear when the propeller blades are at a low pitch and a low gear when the blades are at a relatively high pitch.

AUTOGIROS.

452,364. *Improvements in and relating to Aircraft with Autorotative Wings.* J. de la Cierva, Bush House, Aldwych, London, W.C.2. Dated Jan. 16th, 1935.

This specification relates to the well-known autogiro and is concerned with various expedients for controlling and regulating the rotor blade pitch angle, the devices for this purpose falling into two groups. In the first the pitch angle is positively regulated by mechanism independent of the forces on the blade or manually by the pilot, in which case the control will be rendered at least semi-automatic. In the second the pitch angle is controlled in a fully automatic manner in accordance with the balance of forces experienced by the blades themselves.

- 452,365. *Improvements in and relating to Aircraft with Autorotative Wings.*
J. de la Cierva, Bush House, Aldwych, London, W.C.2. Dated Jan. 16th,
1935. No. 1,547.

This specification is concerned with autogiros in which the pitch regulating mechanism of the rotors is automatically regulated. The object of the invention is to minimise the risks attendant on an unintentional take-off should the engine stop or slow down, which would cause a sudden increase of pitch in a rotor with automatic pitch control. Also, if in the air the engine torque picks up, a sudden increase of torque would take place which would reduce the pitch and cause the machine to fall heavily.

- 452,397. *Improvements in and relating to Aircraft with Autorotative Wings.*
J. de la Cierva, Bush House, London, W.C.2. Dated Jan. 16th, 1935.
No. 1,347.

This specification relates to means for destroying the lift of the wings on the machine alighting on land or water. The means for this purpose may be actuated by contact with the ground, water or otherwise, by decreasing the pitch angle of the rotor.

- 452,366. *Improvements in and relating to Aircraft with Autorotative Wings.*
J. de la Cierva, Bush House, Aldwych, London, W.C.2. Dated Jan. 16th,
1935. No. 1,548.

This specification relates to autogiro blades particularly adapted for obtaining the best direct take off. For this purpose the minimum drag of the wing must be as low as possible, hence the solidity of the rotor should be very small and the blades should taper towards the tips. The blade is also to have a non-uniform section so that a small portion of the blade has a stable pitching moment and the rest of the blade has an unstable pitching moment, these parts being so proportional that the overall pitching moment of the blade is substantially neutral.

- 452,922. *Improvements in or relating to Power Transmission Mechanism for Aircraft.* Yoxall, York House, Deganwy, North Wales, and Propello
Inventions, Ltd., 105, Cheyne Walk, Chelsea, London. Dated Feb. 1st,
1935. No. 3,388.

This device is intended for use in driving the rotor of a gyroplane from the engine. It is stated that it is undesirable to accelerate these rotors with the aid of slipping clutches and it is proposed therefore to interpose between the engine and the rotor a mechanism comprising a fluid flywheel, hydraulic coupling or torque connector having two or more members relatively and individually rotatable combined and arranged with change speed gearing of any type (e.g., countershaft, epicyclic infinitely variable) to operate between the engine and the rotor.

- 452,407. *Improvements in and relating to Aircraft with Autorotative Wings.*
Juan de la Cierva, Bush House, Aldwych, London, W.C.2. Dated Jan.
16th, 1935. No. 18,394.

This specification refers to autogiros incorporating rotor blade pitch controlling devices of an automatic type when the pitch amplitude is controlled by the balance of forces in the rotor blades themselves. It is proposed to provide automatic means for causing the blades to assume a pitch angle less than that obtaining in normal flight on the application of a braking force to the rotor. One method consists in arranging for a pitch reduction when the blades move forward. There is a compound articulation in place of the drag point which consists of two independent pivot axes, one being inclined upward and outward with respect to the blade axis, and the other is inclined upward and inward with respect to the blade axis, arrangements being made that the displacements are small, and that the displacements about the axes shall take place in succession.

- 456,177. *Improvement in or relating to Aircraft Provided with Rotating Wings.* Jones, T., Cwmbach, Pontyates, Llanelly, Carmarthenshire. Dated July 9th, 1935. No. 19,602.

This arrangement consists of a shaft carrying aerofoils revolving in bearings fixed in direction with respect to the fuselage axis and parallel thereto and set at a small positive angle. It is stated that under these conditions the shaft with aerofoils will rotate. Two such rotating arrangements may be used.

BOMBS AND BALLISTICS.

- 454,078. *Improvements in Aerial Floating Mines for Defence against Aeroplanes.* Tinssonier, Le Plissay, Olivet (Loire), France. Convention date (France), April 17th, 1935.

This specification describes a type of balloon which is intended to carry a charge of explosive to a certain height and then to descend. Explosion takes place if they come in contact with aircraft, otherwise they descend without exploding. The balloon consists of a system of lobes which is capable of expansion at high altitudes. This expansion is utilised to operate an arrangement which deflates the balloon when the predetermined height is reached.

CONTROL OF AEROPLANES.

- 451,469. *Improvement in or relating to the Supporting Surfaces of Aeroplanes.* Lumiere, H., 96, Cours Albert Thomas, Lyons, France. Convention date (France), Jan. 19th, 1935.

In the case of aeroplanes fitted with flaps or split flaps to the inner portions of the wing for the purpose of increasing lift, it is proposed to arrange additional flaps in the fore and aft directions at the outer extremity of the wing flaps. These additional flaps can be opened to 90°, are opened with the wing flaps, and are for the purpose of canalising the air flow between themselves and the sides of the fuselage so as, it is stated, to increase the lift of the flapped portion of the wing.

- 450,676. *Improvements in and relating to Aeroplanes.* Irving, H. B., The National Physical Laboratory, Teddington. Dated Nov. 22nd, 1934. No. 33,632.

In order to produce an aeroplane wing with increased stability in roll it is proposed to use a biplane having two wings of approximately the same span, arranged so that the gap between them decreases to a small value from the centre to the tip. The trailing edge of the upper wing is near the leading edge of the lower wing. To attain this, any arrangement of dihedral angles between the planes may be used. Either or both wings may be tapered, the upper having the greatest taper, or they may be swept backwards or forwards.

- 455,462. *Improved Aeroplanes.* Societe des Aeronefs Miquet, 11, Rue du Palais, Meaux, Seine et Marne, France. Convention date (Belgium), April 26th, 1935.

This is a modified elevator control intended for aircraft of the "Pou" type in which arrangements are made so that the incidence of the rear wing may be altered in conjunction with the front wing so as to give improved control. A cam arrangement is used so that the incidence of either wing can be varied independently or together and in the desired proportions and over the desired range of angle.

- 455,501. *Improvements in or relating to Aeroplanes and the Like.* Nazir, P. P., Marlow, Petersham Avenue, Byfleet, Surrey. Dated April 15th, 1935. No. 11,994.

In order to improve control, especially near the stalling point of an aerofoil, it is proposed to use a wing having a normally closed slot towards the rear,

the slot being parallel with the span. The upper and lower surfaces are connected by a plate associated with the slot which is movable to project downwardly and rearwardly from the wing to give auxiliary lift and, in so moving, to open the slot. The plate can also be made to project above the wing and to increase the drag.

454,490. *An Improved System for Controlling the Evolutions of an Aircraft.* Societe d'Inventions Aeronautiques and Mecaniques S.I.A.M., 1, Route des Alpes, Fribourg, Switzerland. Convention date (France), April 11th, 1934.

This is a device for controlling the evolutions of an aircraft by means of a surface moving with said aircraft and subjected to the reaction of the medium in which it moves, of the kind in which said surface is subject to an effort exerted thereon by a gas under pressure, the degree of which is controlled by the pilot.

453,928. *Automatic Steering Arrangements for Air and Water Craft.* Siemens Apparate und Maschinin Gesellschaft mit Beschränkten Haftung, 4, Askaniher Platz, Berlin, S.W.11, Germany. Dated Dec. 14th, 1934. No. 35,962. Specification not accepted.

It is proposed to use an automatic steering arrangement comprising a main steering surface such as a rudder or a damping surface for the trim compensation of aircraft, adapted to be controlled through an auxiliary steering surface by means of the relative flow in combination with automatic steering means, the arrangement being such that the direction finder of the automatic steering means is connected to control an auxiliary motor, which in turn acts on the auxiliary steering surface to vary the position thereof.

456,144. *Improvements in and relating to Motion Transmitting Mechanisms, Particularly for Use in the Actuation of Control Surfaces of Aircraft.* Collar, A. R., National Physical Laboratory, Teddington, Middlesex. Dated May 3rd, 1935. No. 13,283.

This mechanism includes an epicyclic or hypocyclic gear characterised in that the gear is arranged so that the plant pinion is caused to rotate about a stationary gear wheel, and a link is connected to some fixed point on the pinion so that when this point is at a cusp in its path or when it moves at right angles to the direction of the link the other end of the link provides a dead centre at some point intermediate between the ends of the stroke of the operated mechanism.

455,721. *Improvements in or relating to Wings or Control Surfaces for Aircraft.* Dr. Ing. E. Heinkel, Serstrasse 15, Warnemunde, Germany. Convention date (Germany), July 17th, 1934.

The proposed wing has two or more sections connected together, adjacent sections along adjacent edges having spars. The connections joining the sections are designed to transmit load from one to the other. There are also covering members for concealing the gaps which are inserted between the edges of the outer covering so as to avoid gaps. It is claimed that this construction facilitates manufacture, and that the multiplicity of spars minimises bullet damage.

ENGINES.

451,849. *Improvements in or relating to Power Producing Means for Ships and other Craft.* Kresel-Williams, G. H., Calle-Corrientes 345, Rosario de Santa Fe, Argentina. Dated Jan. 7th, 1935. No. 509.

It is proposed to employ means for ships and other craft for producing power by providing a motor adapted to be operated by the fluid flowing past the craft. This may be utilised for assisting propulsion or for generating electric current,

etc. The fluid motor proposed consists of a screw shaped member rotating inside a venturi, the external form of the screw being shaped to the interior of the venturi.

451,525. *Improvements in Cowlings for Air-Cooled Internal Combustion Engines for Aircraft.* The Bristol Aeroplane Co., Ltd., Fedden, A. H. R., and Mayer, F., all of Filton House, Bristol. Dated May 21st, 1935. No. 14,859.

It is proposed to arrange a movable flap on each side of a N.A.C.A. cowling for an aircooled engine. When it is desired to increase cooling, these flaps, which are hinged on their front edges, are swung outwards. In order to permit the engine accessories which are mounted at the rear of the engine to be inspected or serviced, arrangements are made so that these flaps can be swung out still further, so that the accessories can be reached through the aperture so provided.

451,577. *Improvements in Flexible Mountings for Aircraft Engines.* Paulsen, J. F., 6, Rue Francois Gaillard, Viroflay, Seine et Oise, France, and Strachovsky, N., 31, Rue le Mariro, Paris, France. Dated Dec. 1st, 1934. No. 34,528.

The arrangement proposed comprises a flexible engine mounting in which there is a plate member attached to the engine, and a plate member attached to the engine supports. These have flat surfaces perpendicular to the crankshaft. The flat surfaces are bonded together with resilient material. The engine is supported solely through resilient material in shear. Another resilient mounting is proposed in which there are a number of members connected to the engine, and a number connected to the engine support. These are bonded together by resilient material so that the abutting pieces of the resilient material lie in planes at right angles to the crankshaft.

451,296. *Improvements in or relating to Cooling Arrangements for Radial Cylinder Internal Combustion Engines for Aircraft.* The Bristol Aeroplane Co., Ltd., Filton House, Bristol, and Fedden, A. H. R., Filton House, Bristol. Dated March 22nd, 1935. No. 9,011.

In an air-cooled radial engine having a cowl of the shape of that known as an N.A.C.A. cowl with the exhaust ring found in the leading edge of the cowl, it is proposed to arrange a partition behind the exhaust ring and between it and the cylinders so as to divide the oncoming air stream into two sections, an inner which cools the cylinder, and an outer which cools the exhaust ring. The air heated by the exhaust ring may be discharged through conduits inside the cowl, which conduits may also contain exhaust pipes, or this air may be discharged through the periphery of the cowl.

455,248. *Improvements in Cowls for Air-Cooled Aircraft Engines.* Bristol Aeroplane Co., Ltd., Fedden, A. H. R., both of Filton House, Bristol, and Copley, J. W., 44, Norton Road, Knowle, Bristol.

This proposed cowl has a number of movable flaps at its trailing edge so that the rate of airflow through the cowling may be adjusted. The flaps are hinged about axes which lie on the chords of a transverse cross section of the cowl, and are arranged to be spread outwards so as to increase the cross sectional area of the annular orifice between them and the aircraft body.

454,664. *Improvements in or relating to the Cooling of Aircraft Engines.* de Havilland, G., and The de Havilland Aircraft Co., Ltd., Hatfield Aerodrome, Hatfield, Herts. Dated April 24th, 1935.

It is proposed to use an enclosed compartment containing the parts of the engine requiring to be cooled, to which air is fed from openings located in the

wing, in a position of positive air pressure, the outlet from the enclosed compartment being situated in a region of low air pressure. In one example it is proposed to locate the inlet openings at the leading edge of the wing.

454,753. *Improvements in and relating to Aeroplanes and Flying Machines.* Aeroplanes Morane-Saulnier Societe Anonyme de Constructions Aeronautiques, True Volta, Pateaux, Seine, France. Convention date (Germany), Jan. 26th, 1935.

It is proposed to mount wing engines in aircraft by attaching them to the front of the front spar of the wing and supporting them by bracing. A horizontally opposed multi-cylindrical engine is preferred as it does not project over or under the wing. The cowling used in this case is of similar shape to the nose of a wing.

456,674. *Improvements in the Mounting of Radiators of Internal Combustion Engines Used in Aircraft.* Cowdray, C., 4, The Nook, Derby Road, Chelaston, Derby, England. Dated June 27th, 1935. No. 18,418.

It is proposed to mount the radiator of a liquid cooled engine directly on the crankcase and below the engine itself. The engine has four special lugs cast on the crankcase to each of which the apex of a triangular shaped member is attached with a bolt cushioned with rubber. The bases of the triangular members are attached to the radiator, also through cushioned connections. The rear triangles are deeper than the front ones so that the placing of the radiator conforms with the shape of the engine cowling.

456,702. *Device for Controlling Aircraft Motors.* Ruspoli, E. A., 19, Avenue Rapp, Paris 7, France. Convention dates (France), Jan. 22nd, 1935, and Oct. 14th, 1935.

This is a device for ensuring that all the engines of a multi-engined aeroplane rotate at the same speed, and the control depends on the frequency of an alternator, which may be driven either by an accumulator and electric motor or by one of the aeroplane engines concerned. The throttle controls of the controlled engines are governed by a differential regulating device subjected to the difference between the actual speed of the motor and that corresponding to the frequency of the synchronising current.

456,335. *Improvements in Radiator Cowling for Aircraft.* Ellor, J. E., Grandell, South Drive, Chain Lane, Mickleover, Derby. Dated April 3rd, 1935, No. 10,418, and April 16th, 1935, No. 11,761.

In the case of radiators for fluid-cooled engines it is proposed to vary the air flow through the radiator by means of a flap at the rear of the tunnel enclosing the radiator. The flap is hinged at its forward end and is hinged to the radiator tunnel at the part of the tunnel remote from the fuselage.

454,266. *Improvement in or relating to Aircraft and other Craft or Vehicles.* Stewart, C. J., and Meredith, F. W., both of Royal Aircraft Establishment, South Farnborough, Hants. Dated March 28th, 1935, No. 9,704, and Jan. 13th, 1936, No. 1,113.

It is proposed to raise the kinetic energy of the air stream at its discharge from a duct by transferring to it waste heat from the engine at a position behind the cooling surfaces and before further loss of pressure is sustained beyond that involved in passing the stream over the cooling surfaces. The heat of the exhaust gases may be discharged into the stream. It is stated that in aircraft travelling at about 300 m.p.h. the resistance of the cooling arrangements may be much reduced by this scheme and that it may even produce a thrust.

FLUID MOTION.

456,063. *Methods of Creating a Force by Discharging a Pressure Fluid into another Fluid under Lower Pressure.* Societe Anonyme d'Etudes des Brevets et Procèdes Counder, Societe Counder, 10, Rue Bardin, Clichy (Seine), France. Convention date (France), Oct. 8th, 1934.

It is stated that if a narrow slot is arranged at one side of a suitably curved surface, an issuing stream of fluid under high velocity will be caused to follow this curved surface, causing a depression in front of the body and causing it to move forward.

HELICOPTERS.

452,880. *Improvements in Aeroplanes.* Shamberger, G. A., Box 62, Rural Free Delnery, Route No. 1, Town of Shaw, Marion, Oregon, U.S.A. Dated May 3rd, 1935. No. 13,189.

It is proposed to construct an aeroplane having a helicopter-like mechanism for breaking the landing speed to permit the machine to ascend or descend substantially vertically to the ground and to safely descend should the usual straight away motor and propeller fail. The pair of helicopter propellers are mounted in suitable openings through the wing of an aeroplane, said openings being closed for straight ahead flights and while the helicopter propellers are not in use, and a separate engine, or means connected to the usual engine for driving the said propellers.

KITES.

455,067. *Aeroplane Kite.* Trevor, A. H., 1802, South Tower, Seattle, King, Washington, U.S.A. Dated Dec. 30th, 1935. No. 35,968.

The proposed kite is in the form of a biplane aeroplane of normal type, the wings being flexible permitting upward bowing in accordance with wind pressure, and with means whereby the upper wing frame may be adjusted. The kite has a strong propeller and it is stated to be automatically stable.

MISCELLANEOUS.

456,076. *Improvements in and relating to Aerial Posters.* Air Publicity, Ltd., Shell Mex House, London, W.C.2, and Macleod, L. S., Bonbe Buildings, 24, Bramley Hill, Croydon, Surrey. Dated June 21st, 1935. No. 17,858.

This is a streamer towed from aircraft carrying advertising matter. The letters are made up on fabric skeletons and the intermediate struts are disposed in pockets on the leading edges of the letters. These struts keep the towing tapes apart and the letters displayed. The tapes are sewn to the letters. The whole arrangement is loaded or otherwise arranged to be vertical in flight and there may be a blank tail section to maintain steadiness. It is claimed that the letters can be readily changed and that the openwork construction assists legibility.

SEAPLANES.

452,989. *Improvements in Seaplanes, Flying Boats and the like.* Plunkett, D. L., 22, River Court, Portsmouth Road, Surbiton, Surrey. Dated March 29th, 1935.

This specification describes a float for seaplanes which is collapsible and which can be folded into the aeroplane wing. The float itself consists of a collapsible bag which covers a frame. This frame is supported by front and rear members which are hinged to the frame and to the wing so that the float is retractable by parallel link motion of the strut members.