

ABSTRACTS OF PATENT SPECIFICATIONS.

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

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AERODYNAMICS.

462,205. *Improvements in Machines Travelling in the Body of a Fluid.* Oger, G., 27, rue Bodinier, Augers, Maine et Loire, France. Dated Jan. 30th, 1936. No. 2,870.

The proposed machine is not unlike a normal aeroplane in appearance, but the rear portions of the wing (in the case of an aeroplane) are adapted to receive a movement of vibration, and this portion then acts substantially independently of the front portion. It is stated that if the rear portion vibrates with a mean velocity greater than the speed of the relative wind the lifting power of the wing may be increased several times, while the drag is reduced. If the speed of vibration is lower than the wind speed, it is stated that the lift diminishes and the drag is increased.

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 motor vehicle bodies and the like for which it is stated that it is not possible to use the most favourable aerodynamic shapes owing to practical considerations, it is proposed to counterbalance the bad shape by the delivery of pressure air at the points of disturbance, the air being tapped through conduits opening at zones of pressure on the body. Energy may be added to this air by means of fans, blowers, or the like, or the exhaust gases may be used.

AEROPLANES—CONSTRUCTION.

460,318. *Improvements in or relating to Aircraft.* Bonomi, V., Via Cappuccini 22, Milan, Italy. Convention date (Italy), Jan. 16th, 1935.

This specification claims a compound aeroplane comprised of two units, one power driven and one without an engine, the two being uncoupled during flight. The object of the arrangement is to facilitate the take-off of a heavily loaded aeroplane by reducing the wing loading at the time of starting.

462,390. *Improved Construction of Wings, Aerofoils and the like for Aeronautical Machines.* Mayrow, J. J., 35, Goldhurst Terrace, Finchley, London, N.W.6. Dated Aug. 29th, 1935. No. 24,138.

The construction proposed comprises upper and lower contour frames each composed of booms and ribs and the latter are so constructed and arranged that they provide a plurality of points of intersection located on the booms, whereby they form with the booms a meshwork disposed adjacent and conforming to the exterior contour of the structure, the upper and lower frames being connected together by posts jointed to the frames at points where the ribs and booms intersect.

462,539. *Improvements in or connected with the Construction of Aircraft, Bodies, Wings and Aerofoils.* Mayrow, J. J., 35, Goldhurst Terrace, Finchley, Middlesex, N.W.6. Dated Sept. 10th, 1935. No. 25,150.

It is proposed to use spars, ribs or skeleton framing for aircraft with a web of sheet or strip metal formed with central longitudinal corrugations and with transversely corrugated borders on opposite edges, the transverse corrugations being engaged with flanges on booms and secured thereto.

461,158. *Improvements in or relating to Folding-Wing Aircraft.* The Fairey Aviation Co., Ltd., Hayes, Middlesex, and Lobelle, M. J. O., Ludlow, 298, Langley Road, Langley, Bucks, and Voss, E., Badgercroft, 6, St. Anselm's Road, Hayes, Middlesex. Dated Dec. 20th, 1935. No. 35,332.

The wings are folded by turning each first about a horizontal axis and then about a vertical axis. There may be a fixed stub wing attached to the fuselage, the folding wings being attached to the stub wing. The foldable portion of the wing is carried by means of a cantilever which is rotatable relatively to the non-foldable portion, the cantilever being hinged at the junction of said portions. The foldable portion, when extended, is locked by strong pins passing through eyes on the respective portions. These eyes may be arranged on the circumferences of circles concentric with the cantilever, and it is desirable that common means should be provided for inserting the pins into, and withdrawing them from the eyes, and these means may be arranged to cause the pins to engage or disengage in succession.

457,369. *Improvements in or relating to Sheet Metal Walls and/or Partitions for Aircraft.* Dornier Metallbauten G.m.b.H., Friedrichshafen, Lake Constance, Germany. Convention date (Germany), June 29th, 1935.

It is proposed to stiffen sheet metal panels for aircraft by riveting to them flanged U-section members in which the flanges may be stiffened by means of small up-turned flanges. These members, where they cross, are joined by special cross-shaped fittings which are curved to fit the members, and the whole is fastened together with rivets. It is claimed that U-sectional members which are not of the same height or shape may be jointed in this manner.

457,428. *Improvements in or relating to Doors, Panels, or other Covering Elements.* Thornton, A. A., 7, Essex Street, Strand, London, W.C.2. Dated Feb. 11th, 1936. No. 4,113.

It is proposed to construct doors, etc., of paper rendered rigid by treatment with bitumen. The door is formed of two members spaced from each other, the space between consisting of corrugated material, round tubes packed together, or similar means, the whole being glued together. An outer covering of three-ply may be glued on.

459,793. *Improvements in or connected with the Construction of Aircraft Bodies, Wings and Aerofoils.* Mayrow, J. J., 36, Goldhurst Terrace, Finchley, London, N.W.6. Dated July 11th, 1935. No. 19,870.

This specification refers to spars formed of metal strip in which the web of sheet metal is formed with a series of alternate transverse tapering corrugations, the taper running towards a neutral axis of the web, and in most cases crossing such neutral web, the crests of the corrugations of the upper and lower edges of the web being engaged with curved shape or like longitudinal corrugated metal strips or flange members.

458,985. *Improvements in and relating to Aircraft having Detachable Cantilever Wings.* Baynes, L. E., 144, Cromwell Road, South Kensington, London, S.W.7. Dated July 3rd, 1935. No. 19,068.

The wing is shown in the diagram as being carried above the fuselage by narrowed extensions of the fuselage bulkheads. Across the top of these extensions there is a pair of plates which can be fixed to plates on the wing roots by four pins. A rocking lever operates the ailerons by means of pins fitted in its extremities. These engage slots in bell cranks attached to the wings, which former are wired to the ailerons to increase the ease of dismantling.

458,751. *Improvements in and relating to Aircraft having Variable Incidence Wings.* Baynes, L. E., 144, Cromwell Road, South Kensington, London, S.W.7, and E. D. Abbot, Ltd., Farnham, Surrey. Dated April 22nd, 1936. No. 11,493.

In aircraft of the type in which the incidence of the front plane is variable by the pilot for the purpose of control, it is proposed to balance the normally unbalanced rear portion of the wing by means of a weight attached to a lever connected to the pilot's control. It is stated that in this way a lesser weight is required than if the weight is attached to the leading edge of the wing because of greater leverage.

458,789. *Improvements in or connected with the Construction of Aircraft Wings.* Vickers (Aviation), Ltd., Pierson, R. K., and Bewsher, J., all of Weybridge Works, Byfleet Road, Weybridge Surrey. Dated June 27th, 1935. No. 18,409.

In aeroplane wings constructed on the stressed skin principle it is stated that normal methods of construction either involve projecting parts which increase drag, or else difficulty in removing parts when repairs are necessary. It is proposed, therefore, to construct such a wing with the lower flanges of the ribs detachable and fixed to the lower skin. The skin with the rib flanges is then put in position and attached by means of screws.

462,856. *A Safety Device for Aeroplanes.* Martin, J., Higher Denham, Uxbridge, Middlesex. Dated Dec. 11th, 1935. No. 34,383.

This is a device intended to protect the pilot in the event of a low wing monoplane turning over on to its back while landing. It consists of a sort of slot mounted on a post which can be extended sufficiently to protect the pilot. The post is fitted in the vicinity of the cockpit. Fluid pressure may be used to extend the device.

462,904. *Improvements in Spars for the Wings of Aircraft.* Vogt, R., Oderfelderstrasse 13, Hamburg 37, Germany. Dated Sept. 14th, 1935. No. 25,549.

The spar proposed consists of two approximately semi-circular shells, the abutting edges of which are overlapped by cover strips. The cross-sectional shape may be such that there is more material present at the points of maximum bending stress than at the points subjected to lesser stresses.

AEROPLANES—UNDERCARRIAGES.

- 462,963. *Improvements in Tail Skids or Tail Wheels for Aeroplanes.* Saulnier, R., 5, rue de Monceau, Paris, France. Convention date (France), Nov. 9th, 1935.

It is stated that in normal skids the angle of the skid to the ground varies in use, and that this is objectionable. It is therefore proposed to use a device arranged so that the skid or wheel moves parallel to itself when deflected. In order to attain this the skid tube is supported by a system of levers which constrain it to a parallel motion.

AIRCRAFT—GENERAL.

- 461,669. *Improvements relating to Apparatus for Signalling from or for Display Purposes in connection with Aircraft.* Rangabe, A. R., 5/11, Theobald's Road, London, W.C.1. Dated Aug. 17th, 1935. No. 23,148.

It is proposed to provide a method of towing an advertising device consisting of a flexible banner sign, without the necessity of carrying it in the packed condition and also without the necessity for an undesirably long towing rope. A loop of rope is attached to the article to be picked up and is arranged with a length detachably connected to, and stretched between a pair of vertical supports, so that the article can be picked up by means of a hook attached to the aeroplane.

- 461,318. *Improvements in Aeroplanes or Flying Machines.* Beadon, R. R. à C., The Glen, Valley des Vaux, St. Helier, Jersey. Dated Aug. 10th, 1935. No. 22,616.

The aeroplane proposed has planes in front of and behind the centre of gravity, the planes consisting of superimposed surfaces backwardly stepped, the number of planes aft exceeding the number forward. It is stated that such an arrangement corrects automatically any tilt of the machine.

- 459,639. *Improvements in Aeroplanes de Rougé.* C.R.A.M., 7, Cité Martignac, Paris, France. Convention date (France), May 11th, 1935.

This aeroplane has normal wings but is characterised by the fact that the stabilising and controlling surfaces are carried a considerable distance above the wing by a streamlined support. Rudders may be placed at the lower rear end of the support. A twin-engined machine is described having two sets of stabilising surfaces and two supports.

- 459,895. *Improvements in and relating to Aeroplanes.* Cairns, A., 67, Easton Road, New Ferry, Birkenhead. Dated July 19th, 1935. No. 20,574.

It is proposed to produce a difference of pressure on opposite sides of a rotary disc, by furnishing one side of the disc with a centrally placed projecting tubular ring between which and the outer edge of the disc rearwardly sloping radial vanes or forwardly sloping aerofoil projections are provided and in which outer edge rearwardly sloping auxiliary vanes set with their roots transverse to the disc edge and with their free rear edges spaced out from the disc edge may be provided.

- 457,281. *Aeroplane or Glider of the Rigid All-Wing Type.* Canova, F. P., Via Mario Giuriati 4, Milan, Italy. Dated May 24th, 1935. No. 15,236.

This specification describes an aeroplane having a wing of rhomboidal form which it is claimed has advantages over circular or square wings. It is stated that the large chord near the fuselage has advantages as it can contain all the aeroplane fittings.

AIRSCREWS.

460,149. *Improvement in Gearing for Airscrews.* de Paravicini, T. P., The Old Manor, Abbots Inn, Andover, Hants. Dated July 19th, 1935. No. 20,601.

This specification is concerned with a variable gearing for aircraft engines arranged so that the variable pitch airscrew rotates faster under take-off conditions. The gearing described is of the planetary type controlled by clutches which may, in turn, be controlled by hydraulic mechanism. There is claimed a means for varying the pitch of the airscrew blades and a single controlling member connected to the gear and the pitch controlling mechanism which in one position secures fine pitch and high speed, and in another position a coarser pitch and lower speed.

461,010. *Improvements in and relating to Propulsive Systems for Aircraft.* Baynes, L. E., 144, Cromwell Road, South Kensington, London, S.W.7. Dated Aug. 8th, 1935. No. 22,448.

It is proposed to use at least two lateral airscrews carried by a hollow stub wing projecting at each side of the fuselage and to which the main wing is attached. Each propeller is driven by a central power plant through any suitable gear fitted in the stub wing. The airscrews may be pushers.

460,767. *Cellular Airscrew Propeller and the like.* Crutchley, G. G., 15, Bridge Street, Haverfordwest, Pembrokeshire, South Wales. Dated July 3rd, 1935. No. 18,987.

It is proposed to make propeller blades which are composed of cells. These cells are cavities bounded by a rib or vein of metal or suitable substance built with their axes at the required angle of incidence in the case of a fixed pitch wing and movable as a whole in their lateral plane in the case of a variable pitch wing.

BOMBS AND BALLISTICS.

462,483. *Improved Gun Mountings for Aircraft.* Hiscocks, S. W., Oakland, Belvedere Road, Coventry, and Hughes, H. A., Westfield, 74, Plumstead Road, Norwich, Norfolk. Dated Oct. 30th, 1935. No. 29,912.

It is proposed to provide a frame mounted vertically in an aeroplane fuselage, capable of rotation. At the top and at the bottom of this frame there is a gun mounting so that one gun fires above the fuselage and the other below. The upper gun is capable of being elevated from about the horizontal, and the lower gun is capable of being depressed from about the horizontal, but the guns are trained in unison.

CONTROL OF AEROPLANES.

461,157. *Improved Mechanism for Actuating the Control Surfaces of Aircraft.* The Fairey Aviation Co., Ltd., Hayes, Middlesex, and Youngman, R. T., Walcot, Church Crookham, Aldershot, Hants. Dated Dec. 13th, 1935. No. 34,641.

In order to overcome difficulties experienced in operating the flaps of large aircraft, it is proposed to use a flap which can be lowered bodily from the retracted position to a point below the wing by a lever which is pivoted at its front end on the aircraft wing, and which is part of a link and lever mechanism comprising said lever, a second lever parallel therewith and also pivoted at its front end on the aircraft wing and a link connecting the free ends of said levers, said second lever and said link together constituting a toggle or knuckle-jointed strut the elements of which, when the flap is moved to its lowered position, are straightened out to form one side of a triangulated structure, a second side of which is formed by the first lever, and the third side of which is constituted by the wing structure between the pivotal axes of the first and second levers.

- 462,382. *Improvements in or connected with Flying Machines.* Back, W. E., Mancroft Towers, Oulton Broad, Suffolk. Dated 7th June, 1935, No. 16,560; 7th Feb., 1936, No. 3,753; and 26th Feb., 1936, No. 5,806.

The aeroplane described is a heavily staggered tandem monoplane having ailerons on both wings. These can be moved differentially for banking, or the ailerons on each wing may be moved in opposite directions for control in pitch. They may also be moved together for altering the camber of the wings. Flaps may also be provided. There are a number of claims for operating gear.

- 462,498. *Improvements in or relating to Means for Controlling Aircraft.* The Fairey Aviation Co., Ltd., Hayes, Middlesex, and Youngman, R. T., Walcot, Church Crookham, Aldershot, Hants. Dated March 28th, 1936. No. 9,295.

The device described is a form of flap which consists of a small auxiliary aerofoil mounted below and to rearward of the main wing. It is stated that when this auxiliary aerofoil is set at small angles, it gives an increase of lift, while at large angles, when its leading edge may be in contact with the main aerofoil, it acts as a split flap.

- 462,272. *Improvements in or relating to Aeroplanes.* Passat, H. J. B., 10, Victoria Avenue, Surbiton, Surrey. Dated July 8th, 1936. No. 18,983.

It is proposed to use a front elevator instead of the more usual tail plane elevator. This elevator is fitted in front of the aeroplane wing and in close proximity to it, and it is stated that its aspect ratio is to be at least four.

- 461,353. *Oscillation Vibration Damper for the Mechanism Controlling the Movable Flaps of Aeroplanes.* Bechereau, L., 2, Rue Gervex, Paris, France, and Carronee, R., 1 rue Vauvenarques, Paris, France. Convention dates (France), Jan. 30th, 1935, and May 24th, 1935.

This apparatus is intended to absorb vibrations in the control mechanism of aeroplanes by means of shock absorbers in the control mechanism. The method consists in interposing in the steering control a rectilinear vibration damping apparatus of the piston and cylinder type, in which the piston rod extends on opposite sides of the piston through the braking cylinder, and which exerts a symmetrical action in both directions, the resistance of this apparatus depending solely on the frequency of the oscillations of the flaps.

- 457,454. *Improvements in and relating to Aircraft Controlling Surfaces.* Baynes, L. E., 144, Cromwell Road, South Kensington, London, S.W.7. Dated May 25th, 1935. Nos. 15,328 and 15,329.

This specification describes a readily detachable aeroplane tail plane which can be fitted to the fin rather than to the rear end of the fuselage; the former position is claimed to have advantages. The tail plane, of normal construction, is fixed to the fin by pins inserted in suitable fittings, and the elevators are driven through a pin and slot arrangement by a short transverse shaft at the rear, so that detachment and replacement are facilitated.

- 459,691. *Improvements in and relating to Aircraft having Single Span Wings of Variable Incidence.* Baynes, L. E., 144, Cromwell Road, South Kensington, London, S.W.7. Dated 22nd April, 1936. No. 11,492.

This specification refers to an aeroplane which is controlled by the variation of incidence of the front plane of two planes in tandem. This front plane is of cantilever construction and is supported above the fuselage by two outrigger structures extending laterally and upwards, the apices of which carry the plane,

and are hinged to allow control movements. Struts connect the rear spar of the plane to the pilot's control stick.

459,730. *A Manner of and Means for Controlling an Aeroplane, Glider, or the like Flying Machine.* Blaker, H., 59B, Ekbalpore Road, Kidderpore, Calcutta, Bengal, British India. Dated Aug. 26th, 1935. No. 23,903.

The arrangement proposed consists of a flap operating from a position just under the leading edge of the wing. When folded this flap conforms with the normal aerofoil outline. It is claimed that the arrangement may be used for lateral control, as an air brake, and that it induces an upward pressure on the leading edge of the wing, causing the front of the machine to rise, thereby facilitating recovery from a nose dive.

456,863. *Improved Devices for the Automatic Control of Camber Flaps and the like for Aeroplanes.* Société d'Inventions Aeronautiques et Mécaniques S.I.A.M., 1, Route des Alpes, Fribourg, Switzerland. Convention date (France), April 5th, 1935.

The operation of the flap is done by a hydraulic device consisting of a cylinder, one end of which is connected to a fluid pump, the other to a normal hydro-pneumatic accumulator. A piston in the cylinder is connected to the flap via a piston rod and link. The flap is kept in the down position by means of the compressed air acting on the fluid in the accumulator, the pressure being transmitted to the cylinder. When it is desired to raise the flap, pressure is produced on the other side of the piston by means of an engine-driven pump. As the flap is kept down by air pressure, excessive force on the flap will result in a reduction of angle.

456,969. *Improvements in and relating to Aircraft and Particularly Aeroplanes.* Percival, E. W., 20, Grosvenor Place, London, S.W.1. Dated March 14th, 1935. No. 7,914.

It is proposed to operate wing flaps by means of a manually operated lever connected by a link with a toggle joint through which the flap operation is effected. The lever is fitted with a ratchet and also has a separate arm attached to a spring. This arm is so placed relative to the spring that the spring action becomes greater as the flap is forced farther down, so that the spring force approximately balances the flap force over the working range.

457,114. *Improvements in and relating to Brake or Landing Flaps and other Control Surfaces for Aeroplanes.* Irving, H. B., the National Physical Laboratory, Teddington, Middlesex. Dated May 21st, 1935. No. 14,786.

This is a flap device so designed that the air forces on the flap may be wholly, partially, or over balanced as desired. The flap consists of two or more portions one section of which is pivotally connected on an axis located between its forward and rear edges with a drag rod extending to a point on the aeroplane and pivotally connected with a second point on the aeroplane so that motion imparted to the further section about its pivotal connection with said point will move the first mentioned section away from the general surface of the wing or aerofoil with which the flap or control surface is associated into a position in which the air stream will subject it to forces tending to move its opposite edges in reverse senses about the axis of its connection with the drag rod.

458,887. *Improvements in or relating to Flying Controls for Aircraft.* The Blackburn Aeroplane and Motor Co., Ltd., Seaplane Base, Brough-on-Hull, East Yorks, and Cramshaw, A. H., 4, East Mount, Ferriby, East Yorks. Dated Dec., 31st, 1935. No. 36,055.

This arrangement provides a means for an automatic trimming of an aeroplane control and consists of an operating lever mounted in the control surface which is capable of some freedom of movement relative to the surface. This lever is

connected to a tab. A dashpot is fitted so that the relative movements depend on the setting of the dashpot.

460,841. *Improvements in and relating to Motion Transmitting Mechanisms Adopted, for instance, for the Actuation of the Control Surfaces of Aeroplanes.* Ellis, D. L., National Physical Laboratory, Teddington, Middlesex. Dated May 3rd, 1935. No. 13,282.

The object is to provide a servo control which is self-locking against flutter but not against normal operation. The control member is arranged in driving connection with a worm driving a worm wheel rigidly connected with the control surfaces, so that a definite correlation between the displacement of the servo surface relative to the control surfaces and the displacement of the main control surfaces from its neutral position is secured. The wind force tending to restore the servo surface into its neutral position with respect to the control surface is applied in the rotation of the worm in a direction to assist in the restoration of the control surface also into its neutral position.

460,636. *Aeroplane Stabilising Means.* Gray, W. E., 8a, Bank Parade, Edgware, Middlesex. Dated Aug. 1st, 1935. No. 21,810.

It is proposed to increase damping in roll in the region of the stall and of damping at angles above the stall by providing the upper surface of the wing with a fin or fins near each wing tip. The fins may be parallel or skewed and they extend over the greater portion of the chord and they are of greater height towards the rear. The action of these fins is stated to be in the interception of outward air currents which are stated to exist on the upper surface of a wing when it is stalled.

DE-ICING.

462,570. *Improvements in Fluid Pressure Devices for Aircraft and Other Purposes.* Dunlop Rubber Co., Ltd., 32, Osnaurgh Street, London, N.W.1, and Wright, J., of the Company's Works, Fort Dunlop, Erdington, Birmingham, Warwickshire. Dated Dec. 30th, 1935. No. 35,942.

This is a de-icing arrangement of the type which prevents ice formation by expelling liquid over the wing. The liquid is here expelled in a positive manner through a series of apertures, and there is a hollow member containing a distensible tube, which, by distending, expels fluid from the member. The outer member may have apertures which operate as valves operating under low pressures, and it may be made of rigid or non-rigid material.

458,862. *A New and Improved Method of and Means for Preventing the Formation of Ice on Aircraft.* Van der Horst, H., 22, Alexanderlaan, Hilversum, Holland. Dated June 26th, 1935. No. 18,248.

It is stated that if the leading portions of an aeroplane wing are covered with polished sheet chromium, ice will not form. It is stated that the surface tension of water on polished chromium is less than on any other material so that the water forms drops on the surface and is blown away before it has time to freeze.

ENGINES.

461,169. *Improvements in Mounting Devices for Aircraft Engines and Analogous Purposes.* Martin, J., Martin's Aircraft Works, Higher Denham, Uxbridge, Middlesex. Dated June 22nd, 1936. No. 17,362.

It is proposed to provide means for mounting engines so that they are firmly secured in position and in alignment, and so that they may be easily dismantled. Two hollow or tubular members are adapted to be carried by the engine and mounting, and internal coupling members adapted to be secured between the

hollow members and means for effecting a locking action between the coupling member and one of the hollow members, the arrangement being such that the internal coupling member and said means are withdrawable axially thereof through one at least of the hollow members so that they may be uncoupled.

430,002. *Improvements in and relating to Power Transmission Couplings.* Strandgren, C. B., 14, rue Gallieni, Versailles, Seine et Oise, France. Convention date (France), Nov. 26th, 1932.

This specification describes a form of universal coupling comprising two discs, one driven and the other driving, which are disposed adjacent to each other. The driving disc carries two equal-sized chain wheels connected with a chain symmetrically disposed with reference to its centre. The other disc carries two pins. Each of the chain wheels carries a slot and the two slots are maintained parallel with each other by the chain. The pins engage the slots and transmit the drive. Several alternative arrangements are shown embodying a similar device.

462,682. *Improvements in or relating to Multi-Cylinder Internal Combustion Engine Units.* Scott, B. D., Churn House, Churn, Berks. Dated Sept. 12th, 1935. No. 25,372.

The proposed engine has two sets of cylinders arranged horizontally on each side of the crankcase. Each set of cylinders operates its own crankshaft which are geared together so as to rotate in opposite directions. It is claimed that the arrangement provides a perfectly balanced engine, and that the forces of torque reactions may be annulled.

460,975. *Improvements in and relating to Aircraft Engines.* Baynes, L. E., 144, Cromwell Road, South Kensington, London, S.W.7. Dated Aug. 7th, 1935. No. 22,340.

This specification relates to cooling arrangements for aircraft engines, and it is proposed to provide a rearwardly facing outlet for the cooling air in the trailing portion of the wing immediately in front of a pusher airscrew. The air inlet being arranged in the under surface of the wing adjacent to the part to be cooled. There may also be louvres or scoops.

FUELS.

460,843. *Improved Method and Means for Effecting Transfer of Fuel Containers, Persons, or the like from One Aircraft to Another during Flight.* Atcherley, R. L. R., Fulford Villa, York. Dated June 4th, 1935. No. 16,025.

It is proposed to provide both the "cow" and the "calf" aircraft with means for trailing a line so that when they are flown on parallel courses with approximately similar speeds the lines will trail at a large enough angle to each other for intersection and engagement. Engagement is caused by one aircraft moving across the flight path of the other, after which one line is used to heave the other. One may have a grapnel and the other a stop.

462,818. *Improved Method and Means for Effecting Transfer of Fuel, Containers, Persons, or the like from One Aircraft to Another during Flight.* Atcherley, R. L. R., Fulford Villa, York. Dated Feb. 18th, 1936. No. 931.

This specification describes a method of refuelling a "calf" aeroplane from a "cow" aeroplane in flight. The cow aeroplane has a pipeline and the calf aeroplane has a heaving line of which a part is connected to the pipeline. The calf's line is passed over a pulley or the equivalent and the lee part of the line is pulled away from the calf by a drogue, so the cow's line is pulled in towards the calf by the drag of the drogue.

INSTRUMENTS.

- 458,812. *Improvements in Apparatus for Facilitating Blind Flying.* de Florey, L., 19, Rector Street, City County and State of New York, U.S.A. Convention date (U.S.A.), July 5th, 1934.

It is stated that as the sense of hearing is instinctively associated with the matter of direction the act of steering can be naturally governed by aural indications and that in this way blind flying can be made a more natural and instinctive process. It is proposed to use, in combination, binaural signal receivers, a signal source for said receivers, means sensitive to change from a predetermined normal flying attitude and means controlled by said flight attitude, sensitive means for selectively impressing signal from said source on said binaural receivers in accordance with deviation from said predetermined flight attitude and for creating a neutral signal indication in both receivers under said predetermined normal flying attitude conditions.

MISCELLANEOUS.

- 457,075. *Improvements in or relating to Propelling Devices for Watercraft and Aircraft.* Blicharski, F., Schekanedergasse 2, Vienna VI, Austria. Dated Nov. 20th, 1935. No. 32,199.

Gear for fin-like or wing-like propelling devices working oppositely in pairs wherein the carrier arms of each pair of wings are fitted on two oppositely running parallel shafts which are coupled to common sliding frames or parts, pistons or the like, reciprocated symmetrically with respect to the shafts characterised by each shaft being so coupled in like manner with two sliding frames or the like reciprocated in opposition by a common drive that there are obtained two gear sets similar to each other and running symmetrically opposite to each other.

PARACHUTES.

- 460,114. *Improvements in or relating to Parachutes.* Popelakova, M., Hladkov 701, Prague XVIII, Czechoslovakia. Convention date (Czechoslovakia), June 12th, 1935.

It is proposed to secure parachutes in a pack on the body of the airman comprising one or more connecting members to which the rigging lines of the parachute and the ends of the supporting belts are attached, the connecting members being so secured to the frame of the pack or to the pack itself that they readily become detached therefrom upon the opening of the pack and the parachute. Thus it is possible to use a single type of parachute which may be attached either to the chest, the back, or the seat of the airman with one and the same harness.

- 462,559. *Improvements in or relating to Parachutes.* Pool, Z. H., Flight Lieut., R.A.F., Henlow Camp, Bedford. Dated Oct. 3rd, 1935. No. 27,321.

The parachute described has a canopy incorporating an air vent, and means whereby the effective area of such vent is gradually increased automatically by the deployment of the canopy, and after reaching a maximum is gradually reduced by the approach of the canopy to complete deployment. Means may be incorporated by which the vent can be influenced manually.

- 462,670. *Improvements in and relating to Parachutes.* Nonaka, S., 2079, Taketacho, Naoiri-gun, Prefecture of Oita, Japan. Dated Sept. 10th, 1935. No. 25,165.

This specification describes a parachute intended to permit the wearer to control at will the rate of descent. The parachute has a central escape port with a mov-

able annular wall forming its edge, and the port can be reduced or increased in area by means of a group of cords actuating the said annular wall.

462,671. *Improvements in and relating to Parachutes.* Nonaka, S., 2079, Taketacho, Naoiri-gun, Prefecture of Oita, Japan. Dated Sept. 10th, 1935. No. 25,166.

The parachute described is intended to open promptly with the minimum shock. It has an adjustable escape port, a number of cords for adjusting the size of the port, a central suspension cord connected to the operating cords, a fixed ring suspended near the escape port, a floating ring under the fixed ring, a number of shroud cords, etc.

462,722. *Improvements in and relating to Parachutes.* Nonaka, S., 2079, Taketacho, Naoiri-gun, Prefecture of Oita, Japan. Dated Sept. 10th, 1935. No. 25,167.

It is intended to produce a parachute which opens promptly, accurately, and smoothly when in use. The parachute body has a number of small holes and a number of pocket flaps or resistance members secured to its back along the periphery near the point of attachment of the suspension cords, each of such flaps forming a pocket with its lower edge free, a resistant member being secured to the lower free edge of each of the said pocket flaps and a short cord being provided for limiting the degree of opening of each of the said pockets.

459,222. *Improvements in Parachutes.* Szalay, G., Beniczky utca 10, Matyasfold, Hungary. Dated April 1st, 1935. No. 10,128.

It is stated that known parachutes open with about 30 per cent. reliability and that this specification describes a parachute which opens with complete reliability. The parachute proposed is smaller in diameter than usual and is of multiple formation. In order that as large a resistance as possible may be offered a limited way of escape through the parachute is provided through vents. Reliability in opening is obtained with a ring which may be connected to the innermost part of the parachute sheet by pivoted arms.

ROTOR CRAFT.

461,170. *Improvements in and relating to Aircraft.* Konig, J., Smetamvona-meste 6, Makr Ostran, and Kadlec, J., Prevoz No. 683, Makr Ostran, Czechoslovakia. Convention date (Czechoslovakia), June 29th, 1935.

This aircraft has rotating supporting surfaces of screw-shaped form arranged one above the other rotating in opposite directions and at different speeds. The surfaces consist of curved rods or tubes which are fitted into hubs, a number of these hubs being secured one above the other and driven by toothed gearing.

460,634. *Improvements relating to Aircraft.* Kay Gyroplanes, Ltd., and Kay, D., both of 18, Atholl Crescent, Edinburgh, Scotland, and Dyer, T. W., Durie, New Road, Netley Abbey, Southampton. Dated July 31st, 1935. No. 21,761.

It is proposed to arrange that the rotor mast is mounted in such a manner that when the member is tilted the point of support of the member is moved relative to the aircraft with the object of keeping the centre of lift of the rotor system in substantially the same position to the centre of gravity or with the object of varying the position of the centre of lift relative to the centre of gravity by any predetermined amount.

SEAPLANES.

463,008. *Improvements in Means for Absorbing Vibration in Aircraft.* Short Bros. (Rochester and Bedford), Ltd., and Robinson, G. I., both of Seaplane Works, Rochester, Kent. Dated Feb. 11th, 1936. No. 4,117.

The device is described as used for a wing tip float which is supported by nearly vertical struts cross-braced by two wires, and the device is inserted at the crossing of the wires. As variable loads affect the device, shock is absorbed by means of rubber blocks.

458,905. *Improvements in and relating to Aircraft Landing Sails.* Kraft, E., and Kraft, R., Sogestrasse 23, Bremen, Germany. Convention date (Germany), June 6th, 1935.

The sail (so called) proposed refers to a sailcloth surface towed behind a ship so that it can act as a support for an aircraft, taking, when in use, the shape of the aircraft floats, and, thereby providing dynamic support. It is stated that the projection of the spreaders normally used cause turbulent flow of the water and cause difficulties in operation. It is proposed to overcome this by using spreaders of steel strip so that there is practically no projection. It is stated that with this construction the sail can adapt itself smoothly to the floats and to the continuously changing form of the water surface.

UNDERCARRIAGES.

460,316. *Improvements relating to Undercarriages for Aircraft.* Dowty, G. H., Arle Court, Cheltenham, Gloucester. Dated Oct. 12th, 1935, No. 28,234, and Nov. 14th, 1935, No. 31,582.

This specification is concerned with retractable undercarriages for aircraft and describes means by which in such chassis the extension of the chassis can be effected even if it fails to extend owing to technical difficulties, broken pipe lines, etc. The means proposed for this purpose is a spring which is used as a reservoir of energy, which energy can be utilised for extending the chassis if the normal mechanism fails, or the source of energy may be a compressed air reservoir and a valve arrangement may be used for cutting off from the jack the normal pressure supply and connecting it to the reservoir.