

## 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.

---

### *Aerodromes*

420,864. *Improved Runways for Aircraft.* Boulton and Paul, Ltd., Riverside Works, Norwich, Norfolk, and North, J. D., of Hill House, Eaton, Norwich, Norfolk. Dated Feb. 24th, 1934. No. 6,099.

For the purpose of providing a runway for launching aeroplanes it is proposed to employ a horizontal platform carrying rails mounted on tractors of the caterpillar type. The wheels of the aircraft may engage the rails or there may be an intermediate trolley. As the axes of the tractors are at right angles to the track it is possible to move the runway so that it is directly into the wind by moving the tractors under their own power, each to the required amount. Arrangements are made on the tractors so that the track may be levelled and additional thrust may be imparted to the aeroplane for starting in any known way.

421,876. *Improved Wind-Direction Indicator for Aerodromes and Analogous Situations.* Hart, E. P., The Girls' High School, Pretoria, Transvaal, South Africa. Dated March 17th, 1934. No. 9,582.

This direction indicator consists of a star-shaped arrangement of lights normally buried in the aerodrome. The star has usually eight points, each being terminated by an arrow. Either incandescent or neon lights, etc., may be used, and suitable reflectors are described for each. The lights are controlled by means of a switchgear operated by a wind vane. The indicator may be coloured so as to identify the aerodrome and the switching on or off may be controlled by a light sensitive cell. The lights of the indicator may be so arranged, by means of curved covers or the like, to illuminate the aerodrome.

### *Aeroplanes—Construction*

420,025. *Improvements in or relating to Engine Mountings for Aircraft.* The Bristol Aeroplane Co., Ltd., and Barnwell, F. S., both of Filton House, Bristol. Dated Aug. 30th, 1933. No. 24,063.

In the case of radial engines the mounting normally consists of a metal ring, bolted to the rear of the engine and attached to the fuselage of the aeroplane by means of a braced system of tubes and wires. As portions of the engine, such as carburettors, are arranged behind the ring and project beyond it they have to be dismantled before the engine can be mounted or dismantled. To obviate this difficulty it is proposed to provide a detachable portion to the ring so that the carburettors, etc., may pass through the gap provided when this is removed. This detachable portion is afterwards bolted to the remainder of the ring and may be bolted to the engine before mounting.

420,209. *Improvements in and relating to Aeroplanes with Folding Wings.* Walker, G. E., 65, Rockley Road, Sheffield, 6. Dated Feb. 22nd, 1933. No. 8,994.

This is an arrangement by which the wings of an aeroplane may be folded and unfolded from the cockpit. The wings are hinged on the rear spar close to the fuselage and are folded simultaneously by a lever and rod gear operated by a nut on a screwed rod, which latter is rotated by the pilot. A type of scissors gear is also incorporated so that the control stick can be locked when the wings are folded and unlocked when they are unfolded, the operations taking place automatically. The locking of the wings in the unfolded position is also carried out automatically. The joint in the wing extends diagonally forwards so that the long front spar in the stub end enables a reasonable wheel base to be provided.

420,184. *Improvements in Aeroplane Wings and Like Structures.* A.T.S. Co., Ltd., 3/4, Clement's Inn, Strand, London, W.C.2, and Folland, H. P., Gloster Works, Hucclecote, Gloucester.

In the case of a metal wing of the normal type, it is proposed to attach the ribs to the spars by dowells instead of by friction and to provide means by which the ribs may be removed without dismantling the wing. On each side of each spar the rib carries vertical members which carry the dowells, the latter projecting into suitably supported holes in the booms of the spar. The section of the rib over the spars may be removed for dismantling when the vertical rib members may be swung aside thus releasing the dowells. The rib section and the vertical rib members may be secured by the same rivet. Alternative methods of carrying out the arrangement in which the dowells are fitted on the spar and holes are in the rib members are described and fittings may be used as an alternative to piercing the spar.

420,138. *Improvements in or relating to the Building of Aircraft.* Avions Rene Couzinet, 3-5, Boulevard de Levallois Prolonge, Ile de la Grande Jatte, Levallois-Perret (Seine), France. Dated Feb. 21st, 1933. No. 5,320. The application for a patent has become void.

This specification relates to a method of attaching aeroplane wings to a fuselage, the object being to obstruct, as little as possible, the space within the fuselage. It is proposed to use a narrow girder of great depth, rigid with the wing inserted in the fuselage. As far away as is possible from this girder there is another point of attachment which is only subject to shear stresses. A special application of the arrangement is proposed for seaplanes in which a portion of the structure necessary for the support of the floats is incorporated in the device.

420,146. *Improvements in and relating to Aircraft.* Walker, G. E., 65, Rockley Road, Sheffield, 6. Dated Feb. 22nd, 1933. No. 5,415.

It is proposed to construct aeroplane fuselages of four stamped sections connected longitudinally by bolted or welded flanges. Interposed between the opposite flanges, both horizontally and vertically, are stiffening members bolted to the flanges. These may be adapted to carry the control mechanism, etc. All parts may be corrugated if desired, all corrugations and flanges lying in the direction of flight.

420,120. *Improvements in or relating to the Undercarriage of Aircraft.* The Fairey Aviation Co., Ltd., Cranford Lane, Hayes, Middlesex, and Ordidge, F. H., Soircraft, Croft Gardens, Ruislip, Middlesex. Dated Oct. 26th, 1933. No. 29,737.

In the case of retractable undercarriages which fold backwards, it is not normally possible to house the wheels completely in the plane owing to the limited depths of the latter. It is proposed to obviate this by causing the wheel to turn as it moves backwards so that, when housed, it will lie flat in the wing. The rear support of the wheel chassis is partially forked so as to permit the wheel to be housed between the forks. The rotation of the wheel is effected by means of a bevel gear in the wing which may be disconnected if it is desired to lower the chassis so as to permit the aeroplane to be handled in a low hangar.

421,223. *Improvements relating to Tail Wheels for Aircraft.* Dowty, G. H., 17, Lansdown Crescent, Cheltenham, Gloucester. Dated, June 20th, 1933, No. 32,788; and Jan. 31st, 1934, No. 3,274.

This specification refers to a castoring tail wheel which, when unloaded or lightly loaded, may align itself and which under load may be capable of turning out of alignment, with or without some degree of restraint. The tail wheel is mounted in a fork carried by a tubular member which in its turn is carried by a further tubular member attached to the aircraft. The relative sliding of these members is controlled by springs and by a frictional device consisting of split rings which are coned so that they distort radially under load. This device also brakes the castoring effect. A spring acting on a free cam controls the self-centring.

### *Aeroplanes—Control*

419,559. *Aeroplane Wings.* L.P.R. Co., 277, Park Avenue, City and State of New York, U.S.A. Convention date (U.S.A.), Oct. 11th, 1932.

In wings provided with slots it is proposed to arrange the slot in a fixed position forward of the wing and to close the gaps between the slot and the wing by means of flaps. These flaps are connected by means of a flexible diaphragm, which, with the flaps, forms an airtight compartment. Holes are provided in the leading edge of the slot communicating with the airtight compartment in such a position that, in high speed flight, pressure is produced in the compartment thereby closing the gaps in the wing by the flaps, while at low speeds the air is withdrawn from the compartment and the flaps open. Drainage holes are provided and arrangements for warming may be made so as to prevent freezing.

419,568. *Improvements in Automatic Stabilisers for Aeroplanes, Vessels, Torpedoes and the Like Craft.* Gianoli, M. L., 15, Rue Louis-Philippe, Neuilly-au-Seine, France. Convention date (Germany), Dec. 31st, 1932.

It is stated that apparatus which detects a variation from, say, the course of the craft and which acts on a control for resuming the course, produces pendular oscillations of the craft controlled. It is therefore proposed that the position of the control should be affected by the sign of the deviation (positive when the deviation increases, negative when it diminishes), so that for one and the same

angle of deviation the angle of the control must be, for a negative deviation, materially smaller than for a positive deviation. The apparatus proposed is a complicated system of levers operated by wind vanes and acting on the control member of the craft.

419,687. *Improvements in or relating to the Controlling Mechanism of Aeroplanes.* Fairey, C. R., Cranford Lane, Hayes, Middlesex. Dated, Oct. 26th, 1933. No. 29,734.

In the case of aircraft having variable camber wings and in which, normally, a connection is made so that variation of angle of incidence of the tail plane takes place automatically and concurrently with the variation of the camber of the wings, it is proposed to arrange that either of these variations may be carried out independently of the other. A hand wheel is provided which normally effects, on rotation, the variation of camber, and which, by means of a separate pulley, operates wires which in turn operate a screwjack on the tail plane, which moves the rear spar and effects a variation of the incidence. This separate pulley is arranged to be clutched in or out. Alternatively, the two pulleys may be controlled by gear wheels connected by an intermediate gear wheel, which latter may be moved out of gear.

419,748. *Improvements in or connected with Balancing Means for Control Surfaces of Aircraft.* Vickers (Aviation), Ltd., and Wallis, B. N., Weybridge Works, Byfleet Road, Weybridge, Surrey. Dated May 10th, 1933. No. 14,536.

In the case of aircraft having the control surfaces provided with rear flaps for the purpose of assisting in the angular displacement of the surfaces, it is stated that the ordinary arrangement results in producing an undesirable turning force at small angles of displacement. It is also proposed to use the flap for trimming purposes. In the normal arrangement the rod operating the flap is attached to a fixed bracket so that variation of the angle of the main control results in a continuous angular adjustment of the flap. It is proposed to operate this rod from a crank mounted on a separate shaft which is driven by gear wheels from the main control axis. It is so fitted that over the first period of the movement of the main control surface the flap remains in alignment with the main control surface, but that when the crank approaches a horizontal dead centre the flap is progressively operated in the desired direction. In an alternative arrangement an idle pinion is introduced to increase the rate of angular adjustment of the crank arm which is carried by a Geneva movement, and the control surface can be trimmed in flight by mounting the crank arm so that it can be rocked by a Bowden wire control.

420,928. *Improvements in or relating to Aileron Gear for Aircraft.* The Blackburn Aeroplane and Motor Co., Ltd., Seaplane Base, Brough, Hull, East Yorks, and Bumpus, F. A., Elloughton, Brough, Hull, East Yorks, and Bolton, F., Coldicott, Barrow Lane, Hessle, East Yorks. Dated, Aug. 19th, 1933. No. 23,134.

This specification describes a mechanism by means of which the ailerons of an aircraft may be pulled down or up simultaneously for the purpose of altering the camber of the wing, and at the same time be moved differentially for control purposes. The mechanism is carried in the control stick and consists of a manually-operated bevel gear operating a vertical shaft fitted with a screw and contained in the control stick. On operating the bevel gear the shaft moves up and down and operates a toggle gear at the bottom which operates the ailerons simultaneously. The upper end of the shaft carries an indicator which indicates the position of the ailerons. The ailerons are operated differentially by moving the control stick in the usual manner.

422,813. *Improvements in Control Apparatus for Aeroplanes and other Dirigible Objects.* Meredith, F. W., Royal Aircraft Establishment, S. Farnborough, Hants, and Cooke, P. A., Air Ministry, Kingsway, London. Dated Dec. 19th, 1933. No. 34,695.

It is proposed to control an aeroplane laterally by the use of a universally mounted gyroscope with a horizontal axis with the aid of a servo-motor. The centre of gravity of the gyroscope lies below the fore and aft axis of suspension of the outer gimbal ring, and it is so arranged that during steady curved flight the rate of precession of the inner gimbal, due to centrifugal force on a pendulously weighted part of the gyroscope is equal to the rate of turn of the aeroplane. When the inner ring precesses relatively to the outer ring from a normal position a torque is applied between the outer ring and the frame of a corresponding sign to the relative movement of the rings in a direction to produce a counter precession of the inner ring and restoring means for applying a torque between the two rings when the inner ring precesses relatively to the outer ring in the opposite direction to the direction of precession. The restoring means is a spring connected between the inner and outer rings.

422,493. *Automatic Aerodynamic Stabiliser for Aircraft.* Bemberg, O. E., 28, Rue Emile Menier, Paris, France. Convention dates (France), July 22nd, 1933, and July 10th, 1933.

In this device the automatic stabilisation is controlled by means of a special arrangement supported externally to the aeroplane, possibly above the planes. This special arrangement consists of a rod carrying at its forward end a system of radial planes and at its rear end a similar member. This is pivoted on a universal joint near the forward end of the device, the universal joint being attached to the aeroplane, possibly by means of a post. The movements of this device from the line of flight of the aeroplane are used to correct any deviations of the latter by means of a servo-motor device operating the controls or by direct connection to the controls.

421,766. *Improvements in or relating to Automatic Steering Devices.* Askania-Werke Aktiengesellschaft, Vormals Controlwerkstad Dessau und Carl-Bomberg-Friedman, Unrukstrasse 1, Dessau, Germany. Convention date, Feb. 15th, 1933.

It is proposed to provide an automatic controlling device comprising a rudder motor for effecting the steering and controlled from means responsive to angular deviations or angular movements of the craft through a force controller or relay having relatively movable parts, the operation of the motor being dependent upon the magnitude of the relative displacement of the said parts, return or follow up mechanism for said force controller or relay controlled by said rudder motor or rudder and means independent of external influences for yielding by urging said relatively movable parts to the position of zero relative displacement at which the motor is not operated. The force controller consists of a jet tube, movable before receiving nozzles which are mounted in a movable block or frame connected to the rudder, the jet tube and block being constrained to the zero position by means of springs.

### ***Aeroplanes—General***

420,784. *Improvements in or relating to Flotation Gear for Aircraft.* Dagnall, R. F., 17 Stoke Road, Guildford, Surrey, and Lambert, J. G., 20a, Granby Place, Leicester. Dated April 16th, 1934. No. 11,383.

Reference is made to Specification 410,489, which describes a method of inflating airbags on aircraft from a bottle containing compressed gas. The inflation is carried out automatically as electrical contact is made between two

copper plates by immersion, thus causing the flow of a current which explodes a cartridge. This cartridge propels a plunger which in its turn operates a cutter which cuts a hole in a diaphragm, thus allowing the gas from the cylinder to enter the bags. It is stated that trouble has arisen owing to the cutter being driven back by the gas pressure, thereby sealing the hole it has made. It is proposed to obviate this difficulty by using a pawl operating with a spring-controlled ratchet, thereby preventing the return of the cutter. Means for manual control are provided.

419,539. *Improvements in or relating to Aeroplanes.* Mobbs, R. O., Trading Estate, Slough, Bucks. Dated June 2nd, 1933. No. 15,927.

It is proposed to provide an emergency means of escape from the fuselages of passenger aircraft by providing a sliding hatch carried by a frame attached to the fuselage which can be released by movement of a handle operating the hatch. The sliding hatch is free from any projection which would be liable to catch the clothing of those escaping and is designed to be rain proof.

421,178. *Improvements in Aircraft.* Ockenden, A. G., 10, Midholm, Wembley Park; Neil, J. R., 40, Ealing Road, Wembley; Ockenden, M., 10, Midholm, Wembley Park. Dated May 17th, 1933. No. 14,248.

This specification refers to aircraft possessing an outer rotatable casing which is provided with a spirally arranged propelling device and surrounding an inner shell containing the load, power, etc. The propelling device resembles a screw thread, and it is stated to produce a vacuum in the front of the machine which is thereby drawn through the air. The aircraft is to rise vertically from the ground, to assume a horizontal position when a desired height is reached and to land in a vertical position. Its rear end is provided with means to support it in a vertical position and is cushioned. The mechanism required is described in detail.

422,621. *Improvements in Arrangements for Starting Flight Requiring no Gliding.* Nishi, H., 878, Oaza-Kimüdera, Kimüdera-Mura Kaisa-Gun, Wakayama-Ken, Japan. Convention date (Japan), Aug. 22nd, 1933.

It is proposed to embody in an aeroplane fuselage an apparatus for producing direct lift. The apparatus consists of an upright cylindrical air duct which is considerably flared at its lower end through which air is driven by two concentrically mounted propellers revolving in opposite directions. In the lower end of the duct the air impinges on an annular aerofoil which consists of a ring possessing, radially, an aerofoil section. It is stated that the ring will lift 100 kilogrammes per square metre in an air current of 30 metres per second. Another similar ring is provided, the air current for which is produced by compressed air from a bottle.

422,188. *An Improved Convertible Aeroplane and Motor Road Vehicle.* Nystrom, S., Stjärnorp, Linköping, Sweden. Dated April 8th, 1933, No. 10,545; Jan. 10th, 1934, No. 911; and Jan. 10th, 1934, No. 912.

The arrangement described consists of an aeroplane with wings which fold backwards which is provided with wheels for road use, in addition to a folding chassis. The rear road wheels may be driven from the main engine or from an auxiliary engine, and, if both engines are carried, either may drive the propeller. The wings may be telescopic if necessary for folding.

**Airscrews**

420,313. *Improvements relating to Multi-Engined Aeroplanes.* Stieger, H. J., General Aircraft, Ltd., Croydon Aerodrome, Surrey. Dated June 14th, 1933. No. 16,987.

In multi-engined monoplanes it is proposed to arrange that the discs of the two propellers nearest to the fuselage shall be as adjacent to each other as possible. It is proposed that these discs shall come together beneath the fuselage and the fuselage may be hollowed in their vicinity. The drawing shows a low-winged monoplane in which the wing roots slope sharply up to the fuselage and the two wings are, in addition, connected by a member passing before the fuselage.

421,889. *Improvements in Gearing for Propellers.* Rowledge, A. J., Ellerslie, Trowells Lane, Mickleover, Derby, England; Ellor, J. E., Grandell, South Drive, Chain Lane, Littleover, Derby, England; Rubra, A. A., Red Roofs, Carlton Avenue, Derby, England. Dated June 23rd, 1933. No. 17,874.

This specification describes a method by which two propellers, rotating in opposite directions at the same speed, may be mounted concentrically and driven by a single engine. The propeller shafts are in line with the engine crankshaft. The gear proposed is of the sun and planet type, in which each planet pinion shaft carries three pinions. One of the latter engages the reaction wheel, the other two engaging pinions on the respective propeller shafts. By suitably proportioning these two latter pinions the shafts may be driven in opposite directions at the same speed of rotation. The reaction wheel may be either internally or externally toothed and an alternative scheme is described using bevel gears to produce the same effect.

**Armament**

420,160. *Improvements in Armed Turret Carrying Sundry Materials and adapted to be Lowered from an Aircraft by Means of a Parachute.* Count G. E. Ilia, 9, Via S. Valentino, Rome, Italy. Convention date (Italy), Dec. 13th, 1932.

It is proposed to drop an armed turret from aircraft for war purposes. The turret may contain a number of persons and also quick-firing guns, bomb throwers, ammunition, fire jets, or medical materials, etc., and may be provided with its own means of locomotion. It may be adapted for dropping on land or water. The parachute is automatically detached on landing and, if it collapses on the turret, may be burnt with a petrol flame.

**Autogiros**

420,322. *Improvements in and relating to Aircraft with Freely Rotative Wings.* Juan de la Cierva, Bush House, Aldwych, London, W.C.2. Dated Aug. 5th, 1933. No. 22,105.

In the case of autogiros, where means are provided for applying a starting torque to the rotor for the purpose of imparting an initial rotation prior to flight, the maximum torque so transmissible to the rotor being less than that required for helicopter flight, the power transmission means are adapted to impart to the rotor an initial rotational speed considerably in excess of the mean rotative speed in flight, and means are provided for substantially reducing the rotational drag of the rotor during the application of the starting torque and for utilising the excess kinetic energy stored in the rotor by virtue of its excess speed to generate a thrust sufficient to raise the aircraft off the ground by changing the pitch angle of the rotor blades so that during the application of the starting torque the pitch angle may be decreased. The means for changing the pitch angle operate automatically according to the torque applied to the rotor. The means for changing the pitch angle may operate automatically in response to changes of centrifugal force, or both. Constructional details are described.

417,504. *Improvements in Aircraft.* N.V. Instituut voor Aero and Hydro-Dynamik, 19, Reguliers-gracht, Amsterdam, Holland. Convention dates (Germany), Feb. 2nd, 1932; Feb. 2nd, 1932; Aug. 13th, 1932.

In the case of autogiro aircraft it is proposed to hinge the rotating wings to a lever hinged to the vertical shaft instead of to the shaft itself. This lever is hinged to the shaft in the centre, the ends of the lever carrying the wings. There may be constructed four-bladed rotors on this principle, each pair of wings having its own lever, or the centre joint may be universal.

422,212. *Improvements in and relating to Rotor Blades for Aircraft with Auto-Rotative Sustaining Rotors.* de la Cierva, J., Bush House, Aldwych, London, W.C.2. Convention date (U.S.A.), July 15th, 1932.

In the case of autogiro rotors it is stated that it has been found desirable to stiffen the rotating wings so as to prevent vibration and also to simplify the construction. It is therefore proposed to construct the blades of solid drawn metal tube of appropriate section, and to mount them to the hub by a much wider bearing than previously. Means are described by which the tip form of the blade may be shaped as desired and a stop is provided to prevent the blades dropping when not rotating, in place of the wires sometimes used. The tubular blades are proportional to take all stresses and special means are described to ensure that the connection between the blades and the hub fitting is adequate.

### Engines

420,331. *Improvements in or relating to Evaporative Cooling Systems for Aircraft Engines.* The Fairey Aviation Co., Ltd., Cranford Lane, Hayes, Middlesex, and Lyon, G., Ranmoor, Fulmer Road, Gerrards Cross, Bucks. Dated, Oct. 27th, 1933. No. 29,909.

It is proposed to circulate the engine cooling fluid from the engine to a separator where the vapour is separated from the fluid, the fluid being circulated by a pump. The vapour, after passing through several condensers, is condensed and returns to the system via a second pump. The vapour from the separator is passed, first to a header tank on the leading edge of the wing, then to two condensers constituting the forward portions of the lower surface of the wing, then to two further condensers forming a part of the upper surface of the wing immediately over the previous condensers, then to a condenser on the upper surface of the central portion of the wing, then to a tank via a pressure relief valve, which tank is vented. All condensers are provided with pipes conducting the condensed fluid to the second pump. Various constructions are described, and there are also details of constructive methods.

421,761. *Cowling for Aircraft Engines.* Armstrong-Siddeley Motors, Ltd., and Reynolds, R., both of Armstrong-Siddeley Works, Park Side, Coventry, Warwickshire. Dated Dec. 13th, 1933. No. 35,054.

This specification describes a cowl for air-cooled radial engines which may approximate in shape to either an N.A.C.A. cowl or to a Townend ring, but which carries internally a radial plate extending to the cylinder heads, the object of which is to force the air to flow round the engine cylinders. To assist this action a cylindrical band parallel to the axis of the engine may be attached to the inner edge of the plate.

421,438. *Improvements in and relating to Planetary Reduction Gears for Radial Aeroplane Engines.* Compagnia Nazionale Aeronautica, 23, Via Sistina, Rome, Italy. Convention date (Italy), April 20th, 1934.

It is pointed out that the valve control of radial engines is usually effected by a ring carrying a number of cams which rotates slowly with regard to the

engine speed and which is usually driven by a separate train of gears. It is proposed to drive this cam ring from the propeller reduction gear. This latter gear, which is of the normal sun and planet type, has the shafts carrying the planet wheels lengthened so that each shaft carries an additional gear wheel. This latter gear wheel engages with a toothed ring carrying the cams and the latter can be driven at the desired speed by suitably proportioning the gears. Modifications of the main principal are described and illustrated.

### *Miscellaneous*

421,528. *Device for Producing Helical Whirls*. Loftheim, T. B., Vinderen, Oslo, Norway. Dated March 20th, 1933. No. 8,409.

This device is intended to produce disturbances in fluids of the type described as a wind spout, by which term it seems that a whirlwind is meant. It is suggested that the device may be used as a highly efficient pump for fluids, or, if it is fitted to the nose of an airship or to the boss of a propeller, it is said to materially reduce the resistance of such bodies. The device in its simplest form consists of a pointed metallic rod in which the portion from the point to the full diameter of the rod is deeply grooved, leaving a number, usually four, of curved vanes. When this is rotated it is stated that air issues spirally from the portion of the vanes remote from the point. Various modifications of this device are described and diagrams are given showing how the arrangement can be used as a pump.

### *Model Aircraft*

419,498. *Improvements in Toy Aeroplanes*. Marcus, E., 38, Rue Duret, Paris, France. Convention date (France), March 11th, 1933.

It is proposed to produce toy aeroplanes which may resemble any type of civil or military aircraft by cutting and folding a sheet of paper, etc., which may also be coloured. These are provided with a balance weight in the forward part for balancing, etc. Drawings and descriptions are given of the shapes of material necessary to produce the toy aeroplanes and of the methods of joining the parts.

### *Parachutes*

420,059. *Improvements in or connected with Parachute Equipment*. Irving Air Chute of Great Britain, Ltd., Icknield Way, Letchworth, Herts. Dated, July 26th, 1934. No. 21,927.

This specification refers principally to parachutes of the type which can be freed automatically by means of a line connection to the aircraft and non-automatically by means of a manual release. There are four flaps, the opposite one carrying two and one eyelet respectively, so that they may be maintained closed by two egg-shaped pins, drilled at each end. The holes in the pins carry locking wires which are attached respectively to the cord for automatic release and to the cord for manual release. The cord for automatic release is covered normally by an additional flap and is provided with a snap hook. Elastic cords are provided for facilitating opening. Alternative shapes for the two pins are described and illustrated.

420,048. *Improvements in Releasing Means for Parachutes*. Givry, G., 103, Avenue de Gennevilliers, Colombes (Seine), France. Convention date (France), April 24th, 1934.

The parachute referred to is of the automatically opened type operated by a cord attached to the aircraft. This cord is attached to a spindle on the parachute which has a ball head and is normally retained in a hole in a rigid cylindrical member by means of spring controlled balls. The container has a rigid base and

an extractor is provided, made in star form of thin spring steel covered with fabric.

### *Pilots and Piloting*

422,104. *Training and Testing Device for Pilots.* Rose, L. S., Box 414, Rantoul, Illinois, U.S.A. Dated June 19th, 1934. No. 18,190.

This specification describes an apparatus attached to the ground which can be caused to imitate the attitudes of an aeroplane in the air. It is intended for flying instruction, for checking piloting ability, or for amusement purposes. It consists of a dummy aeroplane mounted within tubular frames similar to the gimbals of a compass. These tubular frames carry compressed air or other fluid to various positions on the dummy aeroplane where it is allowed to escape, thereby producing reactions on the dummy aeroplane. Valves controlling the escape of the air are arranged to be controlled by dummy aeroplane controls, so that the dummy aeroplane can be manœuvred in a manner similar to an aeroplane in flight.