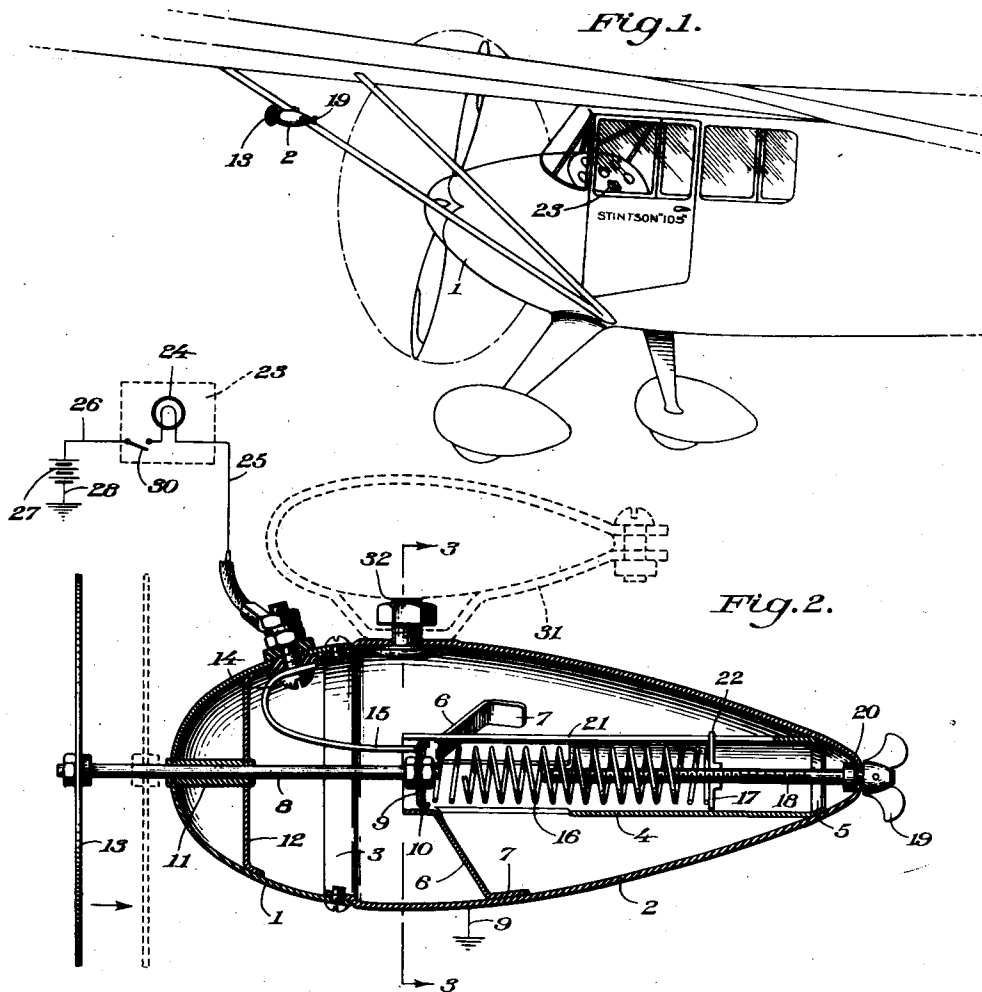
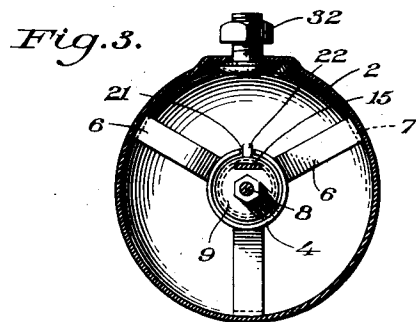


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AIRPLANE STALL INDICATOR

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AIRPLANE STALL INDICATOR

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2 Claims. (Cl. 200—81)

This invention relates to airplane stall indicators, and its general object is to provide a device which warns the pilot when the flying speed of the plane has diminished to an extent that it is about to stall, so that the pilot can accelerate the plane, to prevent the latter from going out of control, thus it will be seen that our device will materially decrease accidents, especially brought about by pilots who have not had sufficient experience to make a safe recovery from an accidental stall.

A further object is to provide a device of the character set forth, that can be installed on planes of various types in an easy and expeditious manner, and is simple in construction, inexpensive to manufacture and extremely efficient in operation, use and service.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawing and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawing wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is a side elevation illustrating our device installed on a strut of a plane.

Figure 2 is a longitudinal sectional view taken through the control unit of the device and illustrates the circuit and warning lamp unit diagrammatically, together with one form of attaching means for the control unit in dotted lines.

Figure 3 is a sectional view taken approximately on line 3—3 of Figure 2, looking in the direction of the arrows.

Referring to the drawing in detail, and particularly to Figure 2, it will be noted that the pressure controlled or air resistance actuated switch unit of our device includes a substantially oval shaped casing that is stream lined in gradually tapered formation toward its rear end and is preferably made up of a nose section 1 and a body section 2, the latter being reduced to provide an annular flange 3 at the forward end thereof to receive the rear end of the nose section that is secured to the flange by screws, so that ready access may be had to the interior of the casing, as will be apparent.

Mounted in the body section for disposal along the longitudinal center thereof is a cylinder 4 that is preferably made from a single elongated strip of sheet material rolled into cylindrical formation. The cylinder 4 has its rear end inwardly

flared to provide a flange 5 seated against the rear end portion of the body section, as well as may be welded or otherwise secured thereto. In any event, the cylinder is shown as having bracket arms 6 struck longitudinally therefrom adjacent its forward end and bent outwardly for disposal at a rearward inclination, and the outer ends of the arms 6 are further bent to provide ears 7 that are fixed to the body section by welding the same or other suitable securing means.

Both ends of the cylinder are open and extending into the front end is a rod 8 having an electrical contact disk piston removably secured to the inner end thereof by lock nuts in the form shown, and the piston is formed with a rearwardly directed peripheral flange 10 having free movement within the cylinder. The rod 8 extends through the front end of the nose section 1 and is slidably mounted in a sleeve bearing 11 having its ends fixed to the section and a bracket member 12 secured to and bridging that section. Removably secured to the outer end of the rod 8 is a baffle or air pressure plate 13 that is preferably of disk shape and of a diameter considerably greater than the largest diameter of the casing, as clearly shown in Figure 2. The plate 13 is shown as being engaged with a collar and held against the same by a nut threaded on the rod.

Secured to and insulated from the casing and preferably arranged on the nose section 1 is a binding post or screw bolt 14 having a leaf spring electrical contact strip 15 secured to the inner end thereof and directed rearwardly for disposal in but spaced from the cylinder and in the path of the disk piston for the latter to engage the contact strip 15 to close a circuit for a purpose which will be later described.

The disk piston is normally urged into engagement with the contact strip by a coil spring 16 that is housed within the cylinder and has one end abutting the piston, while its opposite end abuts a follower disk 17 threaded on a stem 18, the latter being rotatably mounted in and through the rear end of the casing and has secured to the rear end thereof a winged finger member 19 for rotating the stem to adjust the coil spring, for various stalling speeds, as well as to bring about accurate and efficient operation of the device under all conditions, regardless of the type of plane upon which it is installed. A collar 20 is fixed to the stem to bear against the inner face of the rear end of the casing and cooperates with the member 19 for holding the stem in place. The cylinder has a longitudinally extending slot 21 along the upper portion thereof

within which is slidably mounted a lug 22 formed on the follower disk to prevent rotation thereof when the stem is rotated through the medium of the member 19 to adjust the spring, as will be apparent upon inspection of Figure 2.

The warning lamp unit includes a lamp box 23 to be secured on the instrument board of the airplane, as shown in Figure 1, and is provided with a window opening preferably closed by a red colored lens, having the words "Stall" or "Stalling" thereon. Mounted in the box 23 is a lamp bulb 24 in circuit with the control unit by a conductor 25 that is connected to the binding post 14 and the lamp socket. A conductor 26 leads from the lamp socket to a source of current 27 and the latter is grounded by a conductor 28. The casing of the control unit is likewise grounded by a conductor 29 to complete the circuit, and a switch 30 is provided in the conductor 26.

Any suitable attaching means may be provided for securing the control unit in place, and we have illustrated a clamping band 31 shaped to fit the strut of the plane shown, the band being connected to the bolt of a bolt and nut connection 32 and the bolt is secured to the casing. However, the control unit can be attached to a plane directly by the bolt and nut connection 32. In any event, the control unit is arranged so that the plate 13 will be out of the path of the slip stream of the propeller, to be acted upon solely by the natural air resistance brought about by the speed of the airplane.

From the foregoing description and the disclosure in the drawing, it is believed that the operation of our device will be obvious, but it might be mentioned that when the switch 30 is closed, and a plane equipped with our device is travelling at any speed above the stalling speed thereof, the air pressure against the resistance plate 13 will hold the piston 9 out of contact with the free end of the strip 15, so that the circuit will be open. However, when the speed of the plane is diminished to an extent that it is about to stall, the air pressure against the plate 13 decreases to an extent to allow the coil spring to move the piston 9 in contact with the strip 15 and thereby close the circuit to the lamp bulb, to warn the pilot to accelerate the plane so as to prevent the latter from stalling, and going out of control as will be apparent.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

What we claim is:

1. An air pressure controlled switch for a stall indicator for an airplane, comprising a casing to be secured exteriorly of the body of the plane out of the path of the slip stream of the propeller thereof, a cylinder mounted within the casing, a disk piston slidably mounted in the cylinder and providing electrical contact means, a coil spring for the piston and mounted in the casing, a rod having the piston secured thereto and extending through the front of the casing, an air resistance plate secured to the front end of the rod to bring about movement of the piston against the action of the spring, a contact member arranged in the path of the piston, and the latter being urged by the spring to engage said contact member, an abutment member for the spring and the latter having its ends engaging the piston and the abutment member respectively, said abutment member being held against rotation, and handled means having the abutment member threaded thereon for adjusting the spring.

2. An air pressure controlled switch for a stall indicator for an airplane, comprising a substantially oval shaped sectional casing stream lined in tapered formation toward its rear end and to be secured exteriorly of the body of the plane out of the path of the slip stream of the propeller thereof, means for detachably securing the sections of the casing together to allow access to the interior thereof, a cylinder mounted in the casing, tongues struck from the cylinder and fixed to the casing for disposing the cylinder along the longitudinal center of the latter, a disk piston slidably mounted in the cylinder and providing electrical contact means, a coil spring for the piston and mounted in the casing, a rod having the piston removably secured thereto and extending through the front of the casing, a bearing sleeve fixed in the casing and having the rod slidably mounted therein, a disk shaped resistance plate secured to the front end of the rod to bring about movement of the piston against the action of the spring, a spring contact strip secured to and insulated from the casing and arranged in the path of the piston, said piston being urged by the spring to engage the spring contact strip, an abutment disk for the coil spring and slidably mounted in the cylinder, said coil spring having its ends engaging the piston and the abutment member respectively, said cylinder having a longitudinally extending slot therein, a lug formed on the abutment member and mounted on the slot to prevent rotation of the abutment disk, and handled means having the abutment disk threaded thereon and for adjusting the spring.

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