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Dec. 1, 1931. E. METZLER 1,834,858

WING ADJUSTING DEVICE

Filed Aug. 8, 1930

Fig. 1.

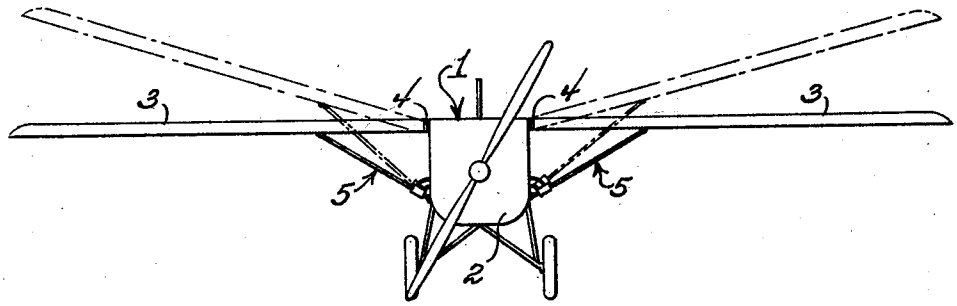
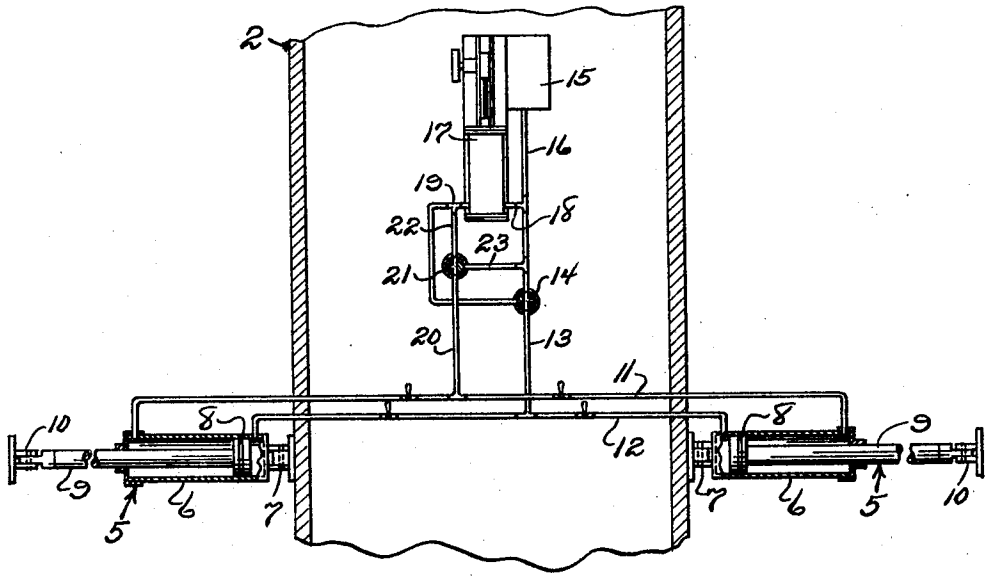


Fig. 2.



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UNITED STATES PATENT OFFICE

EARL METZLER, OF GREENSBURG, PENNSYLVANIA

WING ADJUSTING DEVICE

Application filed August 8, 1930. Serial No. 473,983.

This invention relates to new and useful improvements in wing adjusting devices for aeroplanes and has for the primary object, the provision of means whereby the pilot may easily and quickly vary the angle of inclination of the wings with the fuselage of the aeroplane to facilitate the latter in accommodating itself to varying flying conditions due to storms, air pockets and other natural causes, consequently increasing the safety of aeroplanes thus equipped when flying and also aid in landing the aeroplane in a much smaller space than normally required and further aid in preventing spinning of an aeroplane.

Another object of this invention is the provision of novel struts for the wings which may be varied as to length to change the inclination of the wings relative to the fuselage to meet changeable flying conditions and to aid in landing.

A further object of this invention is the provision of means under the control of the pilot to permit adjustment of the struts as desired.

A still further object of this invention is the provision of wing adjusting devices of the above stated character which will be simple, durable and efficient, and which may be manufactured and sold at a comparatively low cost.

With these and other objects in view as will become more apparent as the description proceeds, the invention consists in certain novel features of construction, combination and arrangement of parts as will be hereinafter more fully described and claimed.

For a complete understanding of my invention, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a front elevation illustrating an aeroplane with my invention applied thereto.

Figure 2 is a horizontal sectional view illustrating the adjustable struts and the means of varying the lengths of the struts.

Referring in detail to the drawings, the numeral 1 indicates a conventional type of aeroplane including the fuselage 2 having the wings 3 hinged thereto as shown at 4 and which are movable relative to the fuselage by struts 5 constructed in accordance with my invention.

The struts 5 are in the form of cylinders 6 pivoted to the sides of the fuselage 2 by brackets 7 and have slidably mounted therein pistons 8 to which rods or stems 9 are secured and the latter are secured to the wings 3 by pivotal connections established by brackets 10. The brackets 10 are secured to the under sides of the wings as clearly shown in Figure 1. Pipes 11 and 12 are connected to the ends of the cylinders 6 as shown in Figure 2 for the purpose of introducing to the cylinders, oil or similar fluid for varying the positions of the pistons within the cylinders and consequently the inclination of the wings 3 relative to the fuselage.

The pipes 11 and 12 extend into the fuselage and the pipe 12 has connected thereto a pipe 13 which is in turn connected to a three-way control valve 14 and the latter is connected to a fluid reservoir 15 by a pipe 16 and the latter is connected to the inlet of a suitable pump 17 by an inlet pipe 18. The pump 17 is of any desired construction and may be driven from the power source of the aeroplane in any suitable manner. An outlet pipe 19 is connected to the outlet side of the pump 17 and connects with the control valve 14. A pipe 20 is connected to the pipe 11 and to a three-way control valve 21 which is in turn connected to the outlet pipe 19 by a pipe 22. A by-pass pipe 23 is connected to the control valve 21 and to the inlet pipe 16.

In operation when it is desired to move the wings into the position as shown in dotted lines in Figure 1, the control valve 14 is positioned so that the fluid from the reservoir 15 may be forced into the inner end of the cylinders 6 forcing the pistons 8 outwardly, consequently positioning or raising the wings into the dotted line positions. The fluid passes from the reservoir 15 through the pipe 16, pump 17, pipe 19, through the control valve 14 and through the pipe 13 to the pipe 12 and then into the cylinders. To lower the wings from the dotted line position shown in Figure 1, the control valve 21 is actuated to permit the fluid from the pump to pass

through said valve by way of the pipe 22 and through the pipe 20 into the pipe 11 and thence to the outer end of the cylinders at the same time positioning the control valve 14 that the fluid at the inner end of the cylinders may pass back into the reservoir. It will therefore be seen that under the pilot's control it is possible to vary the inclination of the wings relative to the fuselage through the manipulation of the control valves 21 and 14.

By the use of the adjustable struts 5 in the manner set forth it is possible for the pilot to position the wings at a dihedral angle of approximately ten degrees which will facilitate the handling of the plane in stormy weather and when encountering air pockets and other dangerous flying conditions due to natural causes and also will aid the pilot in preventing the plane from spinning and further permit the pilot to land the plane in a much smaller space than ordinarily required for landing planes not equipped with the present invention.

While I have shown and described the preferred embodiment of my invention, it will be understood that minor changes in construction, combination and arrangement of parts may be made without departing from the spirit and scope of the invention as claimed.

Having thus described my invention, what I claim is:

A wing adjusting device including a fuselage and wings hinged thereto, cylinders hinged to the fuselage, pistons in said cylinders, stems secured to the pistons and hinged to the wings, fluid conveying pipes connected to the opposite ends of the cylinders and extending into the fuselage, a fluid storage tank in the fuselage, a power driven compressor in the fuselage, a connecting pipe between the tank and one of said fluid conveying pipes, an inlet pipe between the compressor and the connecting pipe, a three-way control valve in said connecting pipe, an outlet pipe between the compressor and said valve, a second connecting pipe between the outlet pipe and the other fluid conveying pipe, a second three-way control valve connected to said second connecting pipe, and a by-pass pipe between said second valve and the first connecting pipe and connected to the latter between the first valve and the inlet pipe, said valves permitting a person to control fluid from the tank and compressor to either end of said cylinders for varying the inclinations of the wings relative to the fuselage.

In testimony whereof I affix my signature.

EARL METZLER.