

UNITED STATES PATENT OFFICE

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INSTRUMENT PANEL FOR AIRCRAFT

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REISSUED

This invention relates to improvements in instrument panels as used in aircraft, and more especially to the arrangement of the instruments on the panel, and the means for adjusting or setting said instruments for a predetermined attitude of flight, whereby after reaching such attitude, any deviation therefrom will be quickly noticed as the indicating hands on the instruments move with respect to the original setting of the instruments.

Another object of the invention is the provision of new and novel means of rotatably mounting the instruments on the panel to permit of easy rotation, but at the same time arresting the instruments against all except intentional movement, and this same means providing a cushioned support for the instruments.

Another object of the invention is the application of luminous paint or the like to the hands and numerals of the instruments, and interconnecting said instruments with a straight line of said luminous paint or the like for convenience in night flying.

These and other objects will appear as my invention is more fully hereinafter described in the following specification, illustrated in the accompanying drawings, and finally pointed out in the appended claims.

In the drawings:

Figure 1, is a front view of the instrument panel as viewed from the operator's cockpit.

Figure 2, is an edgewise plan view of Figure 1, looking in the direction of the arrow in Figure 1.

Figure 3, is an enlarged sectional view of the instrument housing, partly in section, showing particularly the means for rotatably mounting the instruments.

Figure 4, is a rear view of Figure 3.

Referring now more particularly to the drawings:

Reference numeral 1, indicates a usual instrument panel mounted in the pilot's compartment of an airplane. The panel is suitably apertured as at 1^a, to receive various types of flight instruments, such for instance as the air-speed indicator, generally indicated at 2, the climb indicator at 3, the tachometer at 4, and the altimeter at 5. All of these instruments are identical with each other, as far as their shape and size are concerned, and as the method of rotatably mounting them on the panel is the same in each instrument, a description of one instrument and its mounting will suffice for all.

The body of the instrument, indicated at 5^a, is cylindrical in shape and formed with an annular enlargement 6 to which is made integral a ring-gear 7. The body of the instrument is presented to the aperture 1^a from the rear of the panel and advanced therethrough until the annular enlargement 6 abuts the panel. At the same time the front face of the instrument abuts a retaining ring 7^a which is secured to the panel by means of bolts 8 and nuts 9.

A hollow cylindrical housing 10 is provided for the instrument and is also mounted to the panel by means of the bolts 8 and nuts 9. Spaced apart equidistant around the periphery of the housing 10 are a plurality of rollers 11 formed of resilient material, such as rubber or the like. These rollers are rotatably mounted, by means of pins 12, to upturned portions 13 of the housing 10. It will be noticed in Figure 4 that the diameter of the instrument body 5^a is greater than a diameter drawn tangentially to all of the rollers in a relaxed position, that is, with the instrument removed. Then by inserting the instrument the rollers become distorted and cause frictional engagement between the rollers and the instrument body. This frictional engagement permits turning of the instruments by force but prevents unintentional turning.

A pinion gear 14 is fixed at one end of a shaft 15 which is rotatably mounted through the panel. The opposite end of the shaft 14 is provided with a knob 16 for convenience in turning the pinion gear. The pinion gear is in operative engagement with the ring-gear 7, so that the instrument can be rotated by merely turning the knob.

In such cases where the instruments are provided with metallic tubular connections, as shown in Figure 2, portions of rubber hose are interposed between the instrument and the end of the tube to permit of turning the

instruments without disturbing the metallic tube.

On the face of the panel and extending transversely thereof from instrument to instrument is a straight line of phosphorous paint or any other suitable luminous material as indicated at 17. The numerals on the face of each instrument and also the indicating hands are likewise treated with the luminous material for convenience in night flying.

Before making a flight, the instruments are set to indicate a predetermined attitude of flight, for example, as shown in Figure 1, the predetermined air speed will be 90 miles per hour as shown by the air-speed indicator. The revolutions per minute of the engine will be 1650 as shown by the tachometer. The altimeter will be set at the predetermined altitude. The climb indicator of course is always indicating neutral in level flight regardless of speed, altitude or engine speed. It therefore needs no adjustment except if the pilot should want to set the instrument to indicate a certain rate of climb. The time interval of a climbing rate would only be a matter of minutes and upon reaching the desired altitude the instrument would be turned again to indicate neutral or zero.

When the airplane is at rest on the field, the indicating hands of the instruments point downwardly by gravity. The instruments are then rotated independently of the hands until the luminous strips 17 on the panel register with the indicating marks on the dial of the instrument. Then as the airplane leaves the ground the indicating hands start to register; finally when the predetermined attitude of flight is reached the indicating hands will come into alignment with the luminous strip 17, as shown in Figure 1, then any deviation in flight from that attitude will be quickly noticed as all the hands will either move upwardly or downwardly from the strips. For example, if the airplane started to climb the air-speed would be reduced, therefore the hand on the air-speed indicator would move upwardly. The climb indicator would also indicate a climb by its hand moving upwardly. The tachometer would show a decrease of engine revolutions per minute, and the altimeter would show an increase in altitude. If, of course, the airplane would dive, the hands on the instruments would obviously move downwardly.

While I have shown a particular form of embodiment of my invention I am aware that many minor changes therein might readily suggest themselves to others skilled in the art without departing from the spirit and scope of my invention.

Having thus described the invention, what I claim as new and desire to protect by Letters Patent is:—

1. An instrument panel for aircraft comprising a plurality of flight indicating instru-

ments adjustably mounted with respect to said panel and glide lines on said panel interconnecting said instruments.

2. An instrument panel for aircraft comprising a plurality of flight indicating instruments mounted on said panel, indicating marks on said panel and means for adjusting said instruments with respect to said indicating marks.

3. An instrument panel for aircraft comprising a plurality of flight indicating instruments mounted on said panel, indicating marks on said panel and means for adjusting said instruments with respect to said indicating marks, said means comprising a housing for rotatably supporting said instruments and means external of the panel for rotative engagement with the instruments.

4. An instrument panel for aircraft comprising a plurality of flight indicating instruments rotatably mounted to said panel within housings which are fixed to the panel, rotatable resilient means between the housing and said instrument.

In testimony whereof I affix my signature.
CARL E. JOHNSON.

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