Feb. 16, 1932. L. M. WOOLSON 1,845,950

AEROPLANE

Filed Oct. 10, 1929 2 Sheets-Sheet 1.

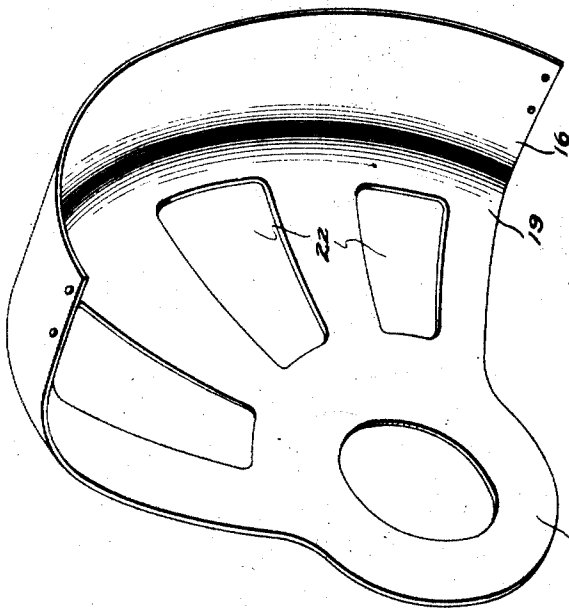


FIG. 5.

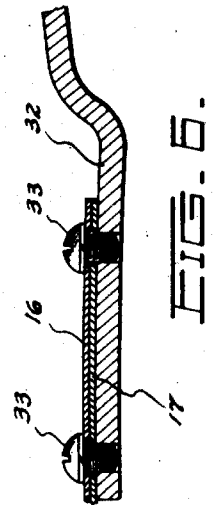


FIG. 6.

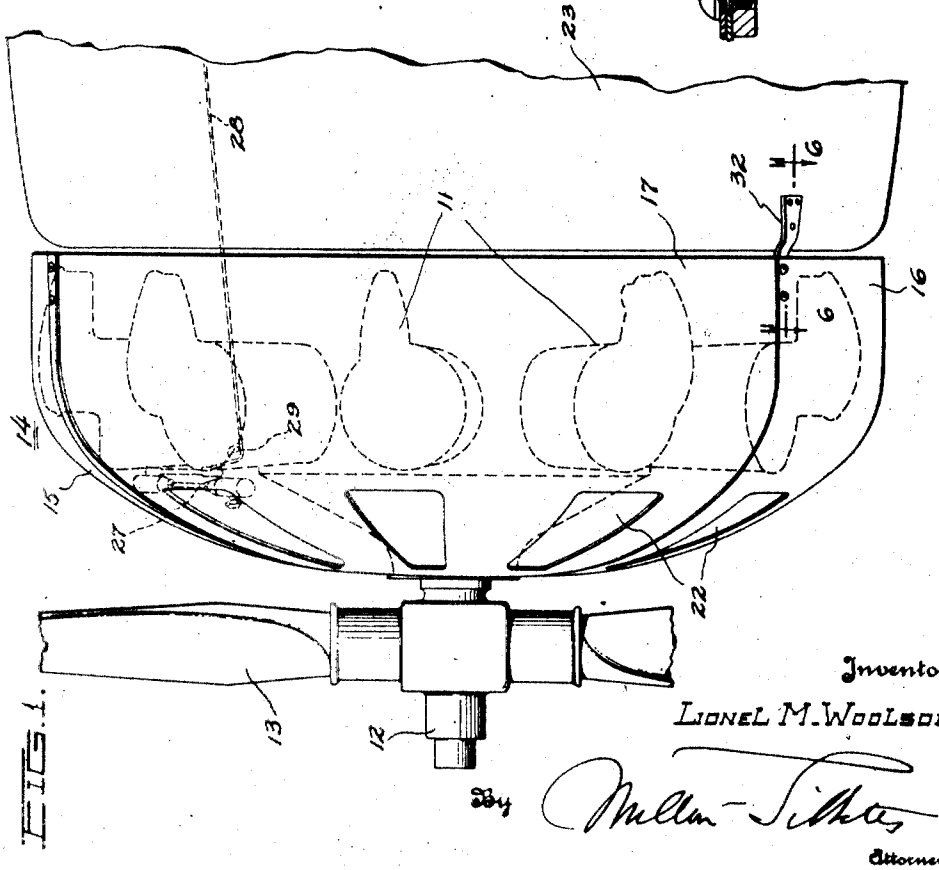


FIG. 1.

Inventor
LIONEL M. WOOLSON
By Miller & Sikes
Attorney

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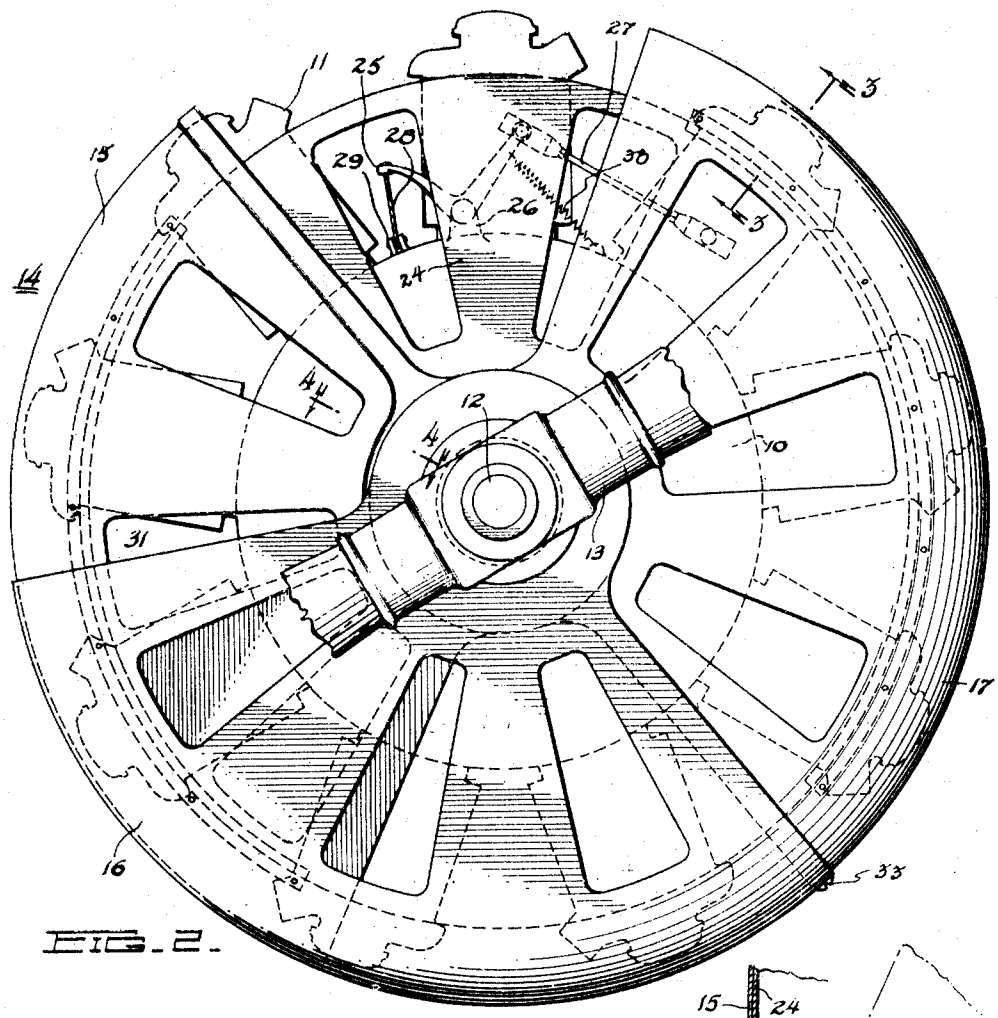


FIG. 2.

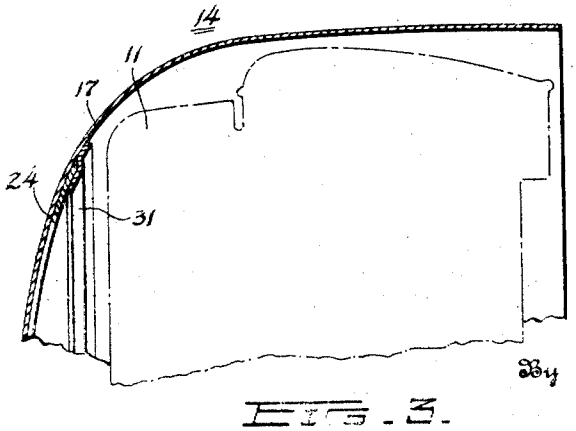


FIG. 3.

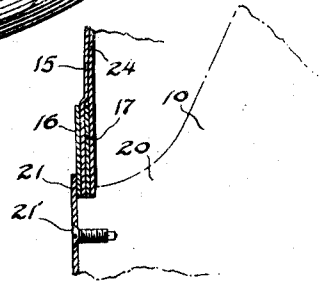


FIG. 4.

Inventor

LIONEL M. WOOLSON

By

Attorney

Patented Feb. 16, 1932 1,845,950

UNITED STATES PATENT OFFICE

LIONEL M. WOOLSON, OF DETROIT, MICHIGAN, ASSIGNOR TO PACKARD MOTOR CAR COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN

AEROPLANE

Application filed October 10, 1929. Serial No. 398,618.

This invention relates to aeroplanes and more particularly to cowling for engines.

It is well known that the shrouding of an aeroplane engine presents a surface which induces greater speed because the resistance to air is less than that of the engine, and the practise of providing cowling for the engine of an aeroplane is quite universal. With the cowling now used, it is necessary to entirely remove the same before access can be had to the engine so that considerable time and effort are required in making even a simple engine adjustment.

An object of my invention is to provide a cowling which permits quick access to any desired cylinder of the engine.

Another object of my invention is to provide a sectional cowling for aeroplane engines which is arranged so that at least one of the sections can be adjusted to expose at least one of the engine cylinders.

A further object of the invention is to provide an engine cowling which is composed of a plurality of rotatably adjustable sections which can be readily manipulated to expose any one of the cylinders.

Still another object of the invention is to provide a combined cowling and shutter structure for an engine in which portions of the cowling can be moved to expose engine cylinders without disturbing the arrangement of the shutter.

These and other objects of the invention will appear from the following description taken in connection with the drawings, which form a part of this specification, and in which:

Fig. 1 is a side elevation of the front end of an aeroplane engine embodying my invention,

Fig. 2 is a front elevation of the same, with one of the cowling sections moved to a position uncovering one of the cylinders,

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2,

Fig. 4 is a sectional view taken on line 4—4 of Fig. 2,

Fig. 5 is a perspective view of one of the sections of the cowling, and

Fig. 6 is a sectional view of the cowling taken on line 6—6 of Fig. 1.

Referring now to the drawings by characters of reference, 10 represents the crank case of an engine with which a plurality of cylinders 11 are radially associated. A crank shaft 12 extends axially through the crank case and a propeller 13 is secured to the forward end thereof. The engine and propeller drive can be of any conventional design and a further description thereof is not thought to be necessary in understanding this invention.

A cowling, indicated generally at 14, is arranged to enclose the engine, and is of a form to closely surround the engine and offer a minimum resistance to the air. The cowling is preferably formed of three members 15, 16, and 17, each of which has a hub portion 18 from which a segmental section 19 extends, the extensions being formed to provide a circular enclosure when associated for progress in the air. The hub portion of the cowling sections are mounted on the forward reduced end 20 of the crank case and are retained thereon by the retainer plate 21 which is secured to the end of the crank case by cap screws 21'. The segments are provided with openings 22 to admit air passage interiorly of the cowling for cooling the engine, and the rear end of the engine cowling is spaced from the forward end of the fuselage cowling 23 to permit such air to pass outwardly.

The amount of air permitted to pass through the engine cowling openings 22 is controlled by a shutter member 24. The shutter consists of a disk mounted on the engine casing extension 20 and provided with openings adapted to register with those in the engine cowling segments. Suitable mechanism is provided to rotate the shutter sufficiently to open and close the cowling openings and to this end I provide a bell crank 25 pivotally secured to a bracket 26 on the engine. An adjustable rod 27 is fixed to the shutter and pivotally connected to the bell crank, while a cable 28 is connected to the other end of the bell crank and extends over a pulley 29 to the cock pit of the aeroplane.

A coil spring 30 is arranged between the bell crank and the engine to normally maintain the shutter in a position closing the cowling openings, and the cable can be pulled and secured to move the shutter in a position to open the cowling openings the desired degree as required to cool the engine as different temperatures are encountered.

The sections 15 and 17 are formed so that the segments thereof will lie in the same plane so that they can be swung beneath the segment 16, or the segment 16 swung thereon as the case may be. The sections 15 and 17 have a guide strip 31 secured to their inner surfaces, such strip serving as a retainer for the outer edge of the shutter. It will be seen that the segments, while slightly overlapping at their adjacent edges, can be rotated as desired to uncover any cylinder, and without interfering with the position of the shutter or its operating mechanism.

Suitable quick detachable means is provided to maintain the cowling sections in relation to completely enclose the engine. A pair of brackets 32 are secured to the fuselage cowling 23 in a manner to project beneath the extreme edges of the segment 16 and the edges of the adjacent segments which are telescoped thereunder. Cap screws 33 are extended through apertures in the overlapping edges of the sections and are screwed into the brackets to retain the segments in fixed position. Upon the removal of the screws from one bracket, either the segment 17 or 15 is released and can be rotated in either direction.

It will be seen that the cowling provided is arranged so that any one of the cylinders can be readily exposed without removal of the cowling or any section thereof, and thus a great saving in time is had when engine adjustments, repairs, or inspection is required.

While I have herein described in some detail a specific embodiment of my invention, which I deem to be new and advantageous and may specifically claim, I do not desire it to be understood that my invention is limited to the exact details of the construction, as it will be apparent that changes may be made therein without departing from the spirit or scope of my invention.

What I claim is:

1. In an aeroplane, a circular cowling for enclosing the power plant formed of a plurality of sections revolvable about the cowling axis.

2. In an aeroplane, a circular cowling for the engine comprising a casing having a portion revolvable about the axis of the cowling to expose a portion of the engine.

3. In an aeroplane, an engine cowling comprising a casing formed of a plurality of rotatable sections detachably secured together and movable to expose any one of the engine cylinders.

4. In an aeroplane, a circular engine cowling comprising a plurality of sections individually rotatable about the axis of the cowling, and means for securing said sections together to form an enclosing casing.

5. In an aeroplane, an engine having a forwardly projecting crank case, a plurality of cowling sections forming a circular cowling for the engine and rotatably mounted on the projecting crank case about the axis of the cowling, and means for retaining said sections together.

6. In an aeroplane, an engine having a forwardly projecting crank case, a plurality of cowling sections rotatably mounted on the projecting crank case, means for retaining the cowling sections together, and means associated with the crank case for retaining the sections on the crank case.

7. In an aeroplane, an engine cowling comprising a plurality of revolvable members each including a hub and a segmental extension.

8. In an aeroplane, an engine cowling comprising three members each including a hub and a segment, the segmental portion of two of the members being rotatable beneath a similar portion of the other member.

9. In an aeroplane, an engine cowling comprising three members each including a rotatable mounted hub and a segmental extension, the extension of two of the members being formed to lay in the same plane and to rotate on one side of the segmental portion of the other member, and means for securing the members together as a casing.

10. In an aeroplane, an engine cowling comprising a plurality of rotatable members, said members having air ports therein, detachable means retaining said members in fixed relation, an adjustable shutter associated with the cowling to control the air ports, and shutter retaining means fixed to the cowling sections.

11. In an aeroplane, an engine, a circular cowling for enclosing the engine formed of a plurality of sections rotatable about the cowling axis, and means associated with the engine upon which the sections are concentrically mounted.

12. In an aeroplane, a radial engine, and a plurality of sections adapted to form a circular housing for enclosing the engine, said sections being rotatable about the cowling axis.

13. In an aeroplane, a radial engine, a cowling comprising a plurality of revolvable sections adapted to form a circular enclosure about the engine, said cowling having circularly disposed openings therein, and a rotatable shutter member associated with the cowling sections to control the openings therein.

In testimony whereof I affix my signature.

LIONEL M. WOOLSON.