Feb. 24, 1931. N. EMMONS, 3D 1,793,786

THROTTLE, SPARK, AND MIXTURE CONTROL

Filed May 31, 1929 3 Sheets-Sheet 1

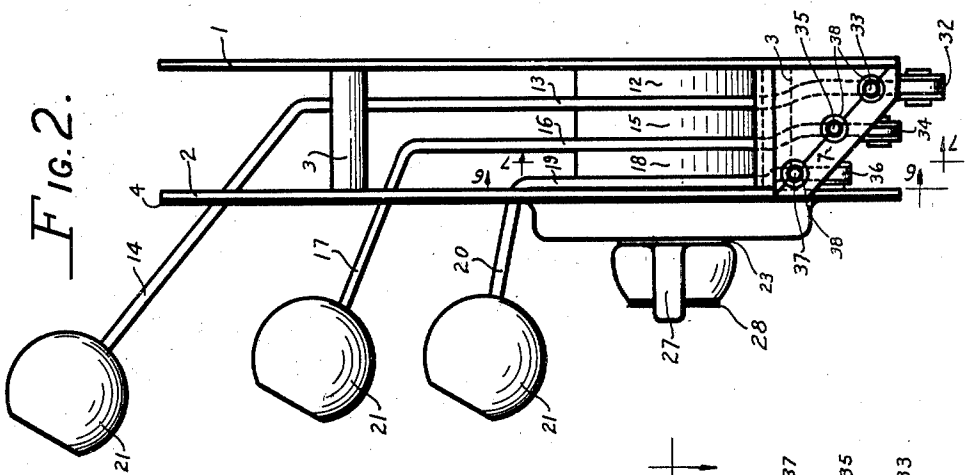

FIG. 2.

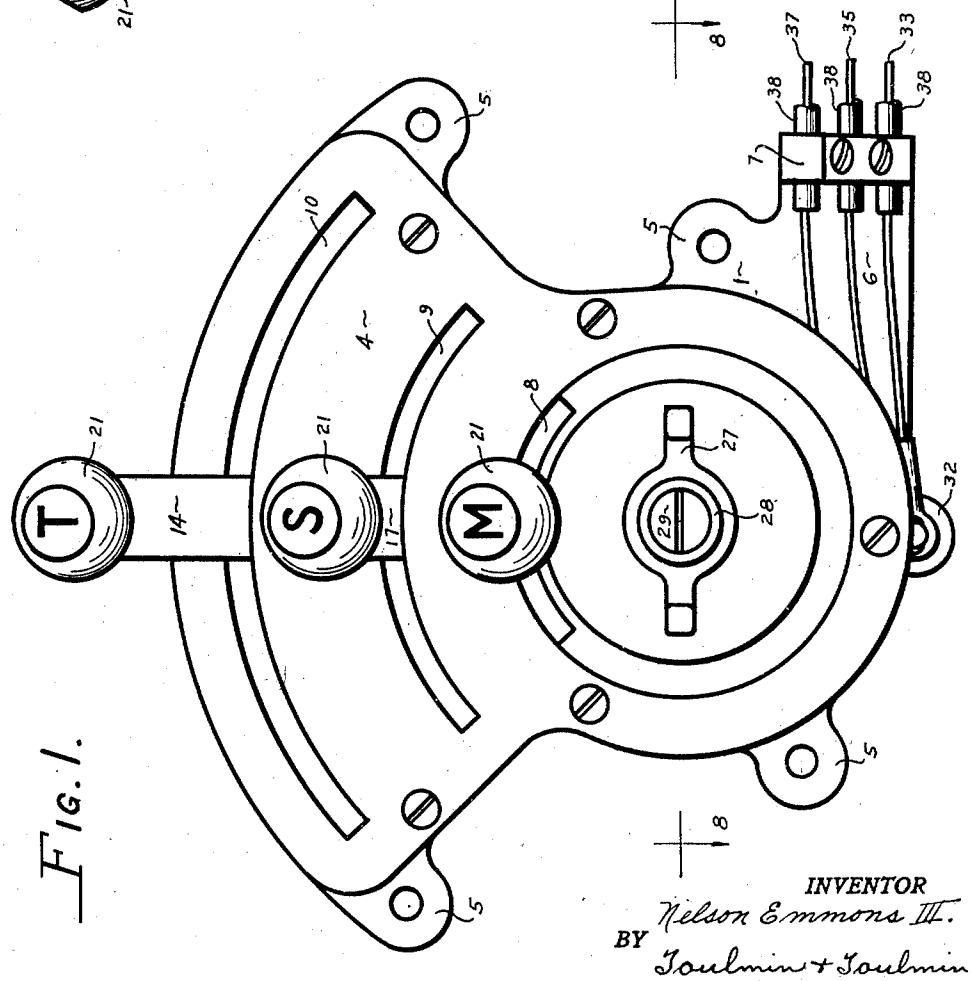

FIG. 1.

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THROTTLE, SPARK, AND MIXTURE CONTROL

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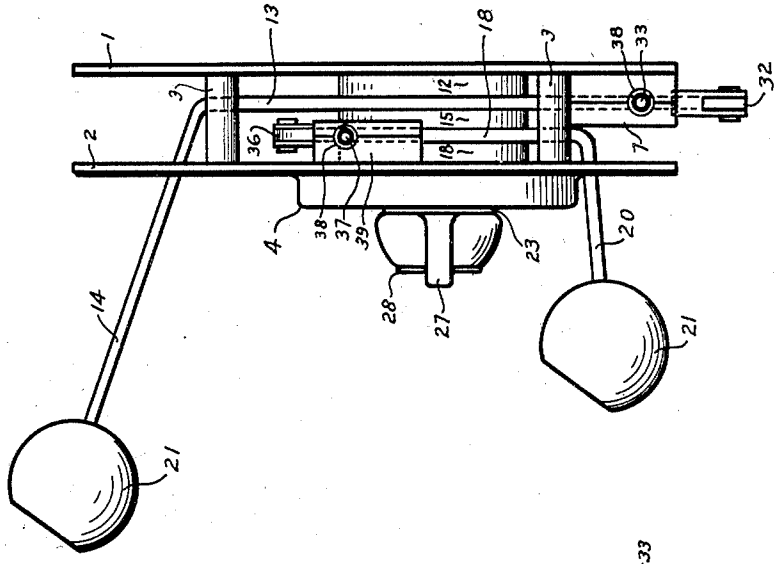

FIG. 4.

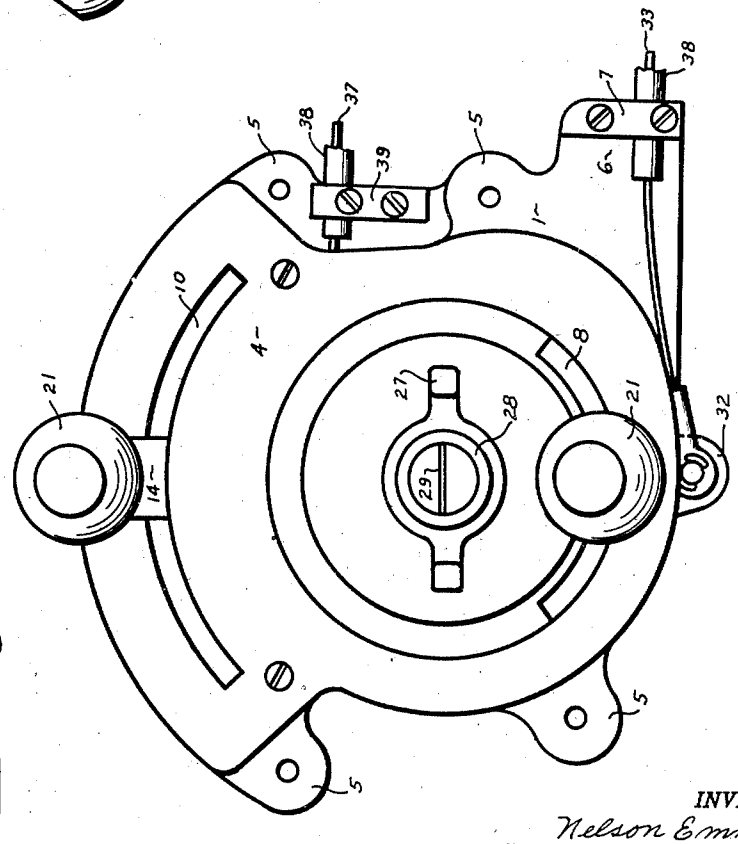

FIG. 3.

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FIG. 5.

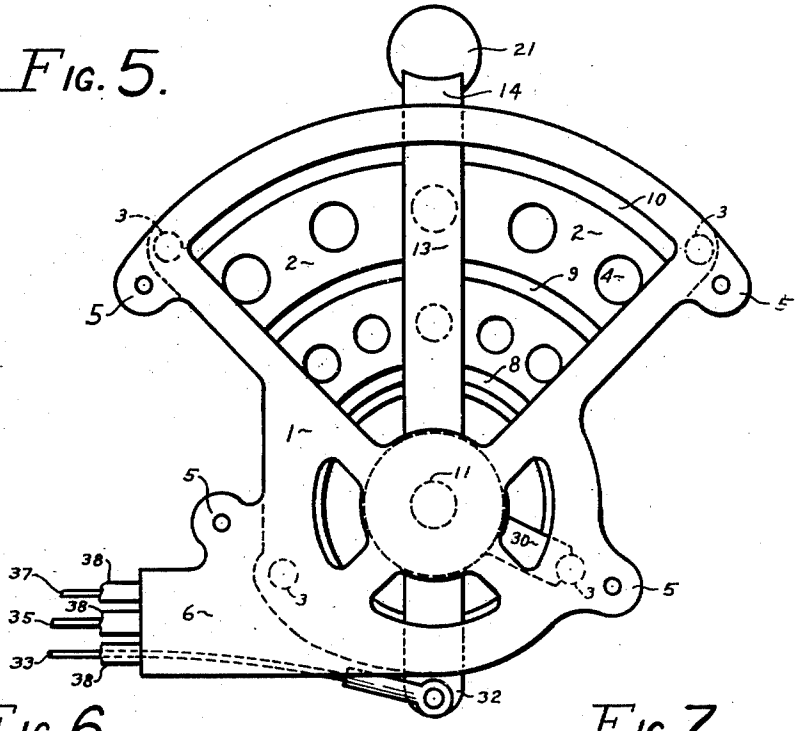


FIG. 6.

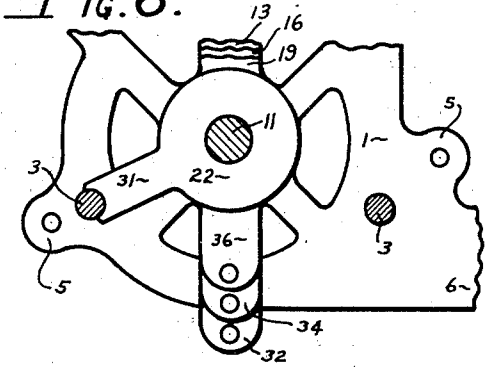


FIG. 7.

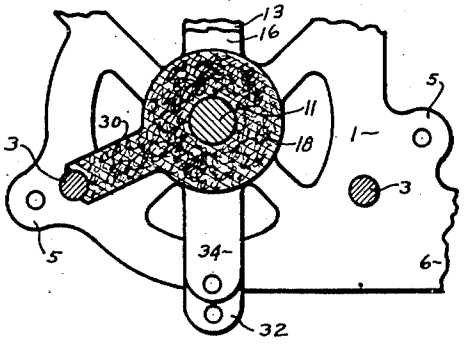
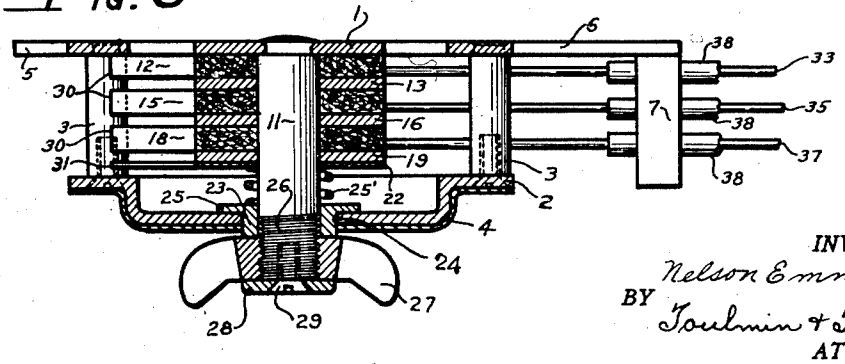


FIG. 8



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UNITED STATES PATENT OFFICE

NELSON EMMONS, 3D, OF DAYTON, OHIO

THROTTLE, SPARK, AND MIXTURE CONTROL

Application filed May 31, 1929. Serial No. 367,169.

It is the object of this invention to provide an apparatus for use in connection with airplanes and other like machines for controlling the throttle, the spark and the mixture of gas for the motor of said machines.

It is especially the object of this invention to provide a device which embodies an assemblage of levers which have connections to the motor for the purpose of controlling from one point the throttle, spark and the mixture of gas.

It is also an object of this invention to provide an apparatus of this kind in which the parts are so adjusted and related that the wear, due to use, may be taken up or the parts may be so adjusted as to increase or diminish the friction between the levers and the cooperative parts therewith, so that the levers may be held in any adjusted position.

It is also an object of this invention to provide means for frictionally locking the levers in different positions so that there will be no rattling, or unintended movement of the levers from the positions in which they are placed.

It is also an object of this invention to provide an apparatus of this kind in which the parts are few, readily assembled, and worn parts readily replaced by new ones.

These and other advantages will appear from the description, taken in connection with the drawings, which show one embodiment of this invention.

Referring to the drawings:

Figure 1 is a top plan view of the apparatus.

Figure 2 is a side elevation thereof, looking at right angles to Figure 1.

Figure 3 is a top plan view of a modified form.

Figure 4 is a side elevation of the form shown in Figure 3.

Figure 5 is a bottom plan view of the form shown in Figure 1.

Figure 6 is a section on the line 6—6 of Figure 2.

Figure 7 is a section on the line 7—7 of Figure 2.

Figure 8 is a vertical section through the form shown in Figure 1 on line 8—8 of Figure 1.

This apparatus is adapted to be attached to the dashboard, or any other suitable part of the airplane or other machine to which it is attached. The supporting part of the apparatus consists of a frame made of aluminum, or some light alloy. The frame is composed of two members, a lower member 1 and an upper member 2. These members are united by a plurality of spacers 3. The numeral 4 is used to designate an ornamental cover plate of the same shape and size as the upper frame member, and is attached thereto by means of screws, as indicated in Figure 1. The lower frame member has extending therefrom a plurality of ears 5 by which the apparatus is attached to the dashboard, or any other part of the machine or car. There is also extending from one side of the lower frame member a projection 6, which has thereon a guide 7.

The upper frame member and the cover plate 4 have extending therethrough arcuate slots. The inner of these slots is indicated by the numeral 8, an intermediate one by the numeral 9, and an outer one by the numeral 10. Suitably attached to the lower frame member is a post 11. This post extends up through a suitable opening in the upper frame member. The purpose of this post is to support the different operating levers which control the throttle, the spark and the mixture.

Surrounding this post 11 and in contact with the lower frame member is a fiber disc 12. Resting on the fiber disc is a throttle lever 13 which has an offset extension 14 extending through the slot 10. Resting upon the throttle lever 13 is a second fiber disc 15 upon which a spark lever 16 rests. The

spark lever 16 has an offset 17 extending through the slot 9. On the spark lever is a fiber disc 18, which has resting thereon a mixture lever 19 that has an offset 20 extending through the slot 8. Each of these levers and discs has holes therein through which the post 11 extends and by which they are supported.

Upon the outer ends of the offset parts 14, 17, and 20 there are knobs 21 which are adapted to be grasped by the hand for the purpose of operating the different levers. Resting upon the mixture lever 19 and surrounding the post 11 is a spring disc 22. On the upper end of the post 11 is a sleeve 23 which extends through holes 24 in the upper frame member 2 and the cover member 4. This sleeve 23 is provided with a flange 25 which engages against the inner face of the upper frame member 2.

The extreme upper end of the post 11 is screw threaded, as indicated by the numeral 26, and has thereon a wing nut 27 which engages the outer or upper part of the sleeve 23. The sleeve 23 is of sufficient length that it extends beyond the outer surface of the upper frame member 2 and the cover plate 4 so that when the wing nut 27 is screwed on the member 11 it engages the end of the sleeve 23.

Between the sleeve 23 and the spring disc 22 is a spring 25′. This spring tends to hold the different discs and the levers in close frictional engagement with each other. The tension of the spring is regulated by means of the wing nut 27 bearing on the outer end of the sleeve 23.

For the purpose of preventing the wing nut 27 from becoming displaced and removed from the post 11, a disc 28 is attached to the end of the post 11 by means of a screw 29. The tension of the spring 25′ may be increased by turning the wing nut down on the post 11 and thereby increasing the friction between the different discs and the levers. By this means any wear between the levers and the discs may be taken up or the friction made so great that the levers are held in position so that they cannot be moved by accident or inadvertence.

Each fiber disc has a projection 30 that has on the outer end thereof forks that receive one of the spacers 3 for the purpose of preventing the disc from turning. The spring disc 22 also has a projection 31. This extension also engages the spacer 3 for the purpose of preventing it from turning.

Each of the levers is provided with an arm. The lever 13 has an arm 32 extending therefrom, to which a cable 33 is attached. This cable or connection extends from the arm 32 to the throttle for the purpose of operating and controlling the throttle. The lever 16 has an arm 34 extending therefrom, to which a cable 35 is attached for controlling the spark. The lever 19 has extending therefrom an arm 36, to which a cable 37 is attached for controlling the mixture. Each cable, as indicated in Figure 8, is provided with a Bowden guide 38, as shown in Figure 8.

In the form shown in Figures 3 and 4 there is an additional guide member 39. In this form instead of there being three levers there are only two, 14 and 20. These levers are similarly located, similarly spaced and similarly controlled to the levers shown in Figures 1 and 2; the only difference is one lever is omitted. The lever 20 in Figures 3 and 4 may be used to control the mixture or the spark, the lever 14 being used for controlling the throttle, as in the form shown in Figures 1 and 2. However, in Figures 3 and 4 there is shown a different arrangement for the mixture or spark lever. Instead of being located in the upper part of the frame this lever is located in the lower part of the frame and extends through the upper frame member and cover plate by means of a slot similar to the slot shown in Figures 1 and 2.

The throttle is controlled by shifting the offset part 14 through the slot 10, while the spark may be advanced or retarded by shifting the offset part 17 through the slot 9, and the richness or leanness of the mixture may be regulated by shifting the offset part 20 through the slot 8.

It will be observed from the foregoing description, taken in connection with the drawings, that this apparatus is composed of few parts, connected in such a manner that any part may be replaced by a new one after it has become worn, and that the apparatus can be so adjusted that lost motion and play, due to wear, may be taken up or the parts locked in any desired position so that there is no rattle or unnecessary or unwanted movement of the parts.

The fiber discs may be composed of any suitable material, the purpose of these discs being merely to hold the levers separate from each other and provide therebetween a certain amount of friction so there will be no unnecessary movement or play between the levers and the other parts of the apparatus. The whole apparatus is constructed of light material so that its weight is negligible, amounting to less or a little more than a pound.

It will be understood that where Bowden wires are not employed any suitable form of control rods or the like may be utilized.

I desire to comprehend within my invention such modifications as may be clearly embraced within my claims and the scope of my invention.

Having thus fully described my invention, what I claim is new and desire to secure by Letters Patent, is:

1. In an apparatus of the class described, a frame having an upper and a lower mem-

ber, a post attached to one member and extending through a hole in the other member, a sleeve on said post and fitting within said hole, a plurality of spaced control members pivotally mounted on said post between a frame member and said sleeve, and means on said post in engagement with said sleeve to clamp said control members to retard the pivotal movement thereof.

2. In an apparatus of the class described, a frame having an upper and a lower member, one of said members having a hole, a sleeve in said hole, a post attached to the other member and extending through said sleeve, a plurality of spaced control members pivotally mounted on said post, a resilient member between said sleeve and said control members, and means on said post to engage said sleeve to compress said resilient member to retard the pivotal movement of said control members.

3. In an apparatus of the class described, a frame having an upper and a lower member, one of said members having a hole, a sleeve in said hole, a post attached to the other member and extending through said sleeve, a plurality of spaced control members pivotally mounted on said post, a resilient member between said sleeve and said control members, and screw threaded means on said post engaging said sleeve to compress said resilient member to retard the pivotal movement of said control members.

4. In an apparatus of the class described, a frame having an upper and a lower member, one of said members having a hole, a sleeve in said hole, a post attached to the other member and extending through said sleeve, a plurality of control members pivotally mounted on said post, a coil spring around said post between said sleeve and said control members, and means on said post engaging said sleeve to compress said spring to retard the pivotal movement of said control members.

5. In an apparatus of the class described, a frame having an upper and a lower member, one of said members having a hole, a flanged sleeve in said hole, said flange engaging the inner side of said member, a post attached to the other member and extending through said sleeve, a plurality of control members pivotally mounted on said post, fibrous disc members separating said control members from one another and from said last-named member, a spring-pressed metal disc between the first-named member and said sleeve, and a nut on the end of said post engaging said sleeve to compress said spring to retard the pivotal movement of said control members.

6. In an apparatus of the class described, a frame having an upper and a lower member, one of said members having a hole, a sleeve in said hole, a post attached at one end to the other of said members and extending through said sleeve with its other end threaded, a plurality of control levers pivotally mounted on said post, fibrous discs separating each lever from the others and from said last-named frame member, a coil spring on said post adjacent said sleeve, a metal disc between said spring and said control levers, and a nut on the threaded end of said post engaging said sleeve to compress said spring to clamp said levers to prevent their pivotal movement on said post.

In testimony whereof, I affix my signature.

NELSON EMMONS, 3RD.