Sept. 8, 1970 L. K. JENNINGS 3,527,265

SPEED CONTROL DEVICE FOR A MODEL AIRPLANE ENGINE

Filed Feb. 17, 1969 2 Sheets-Sheet 1

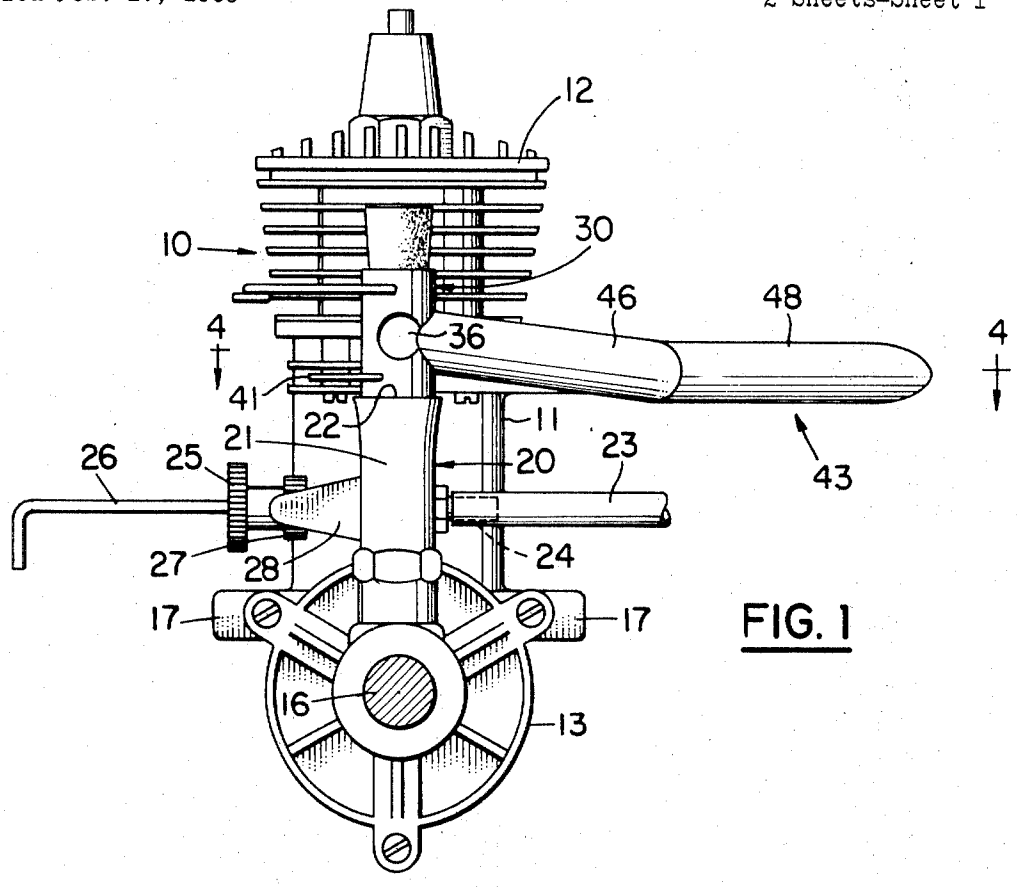
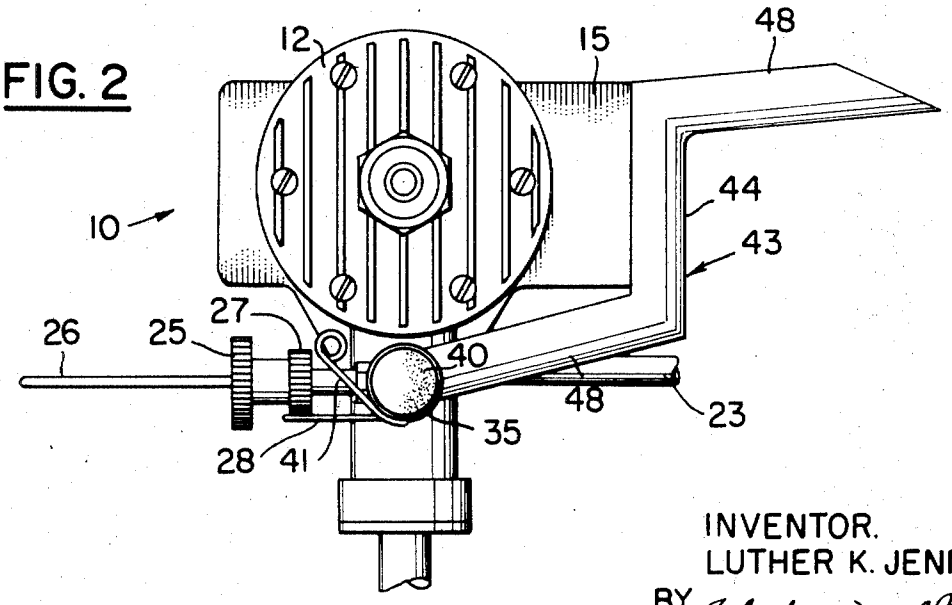


FIG. 1

FIG. 2



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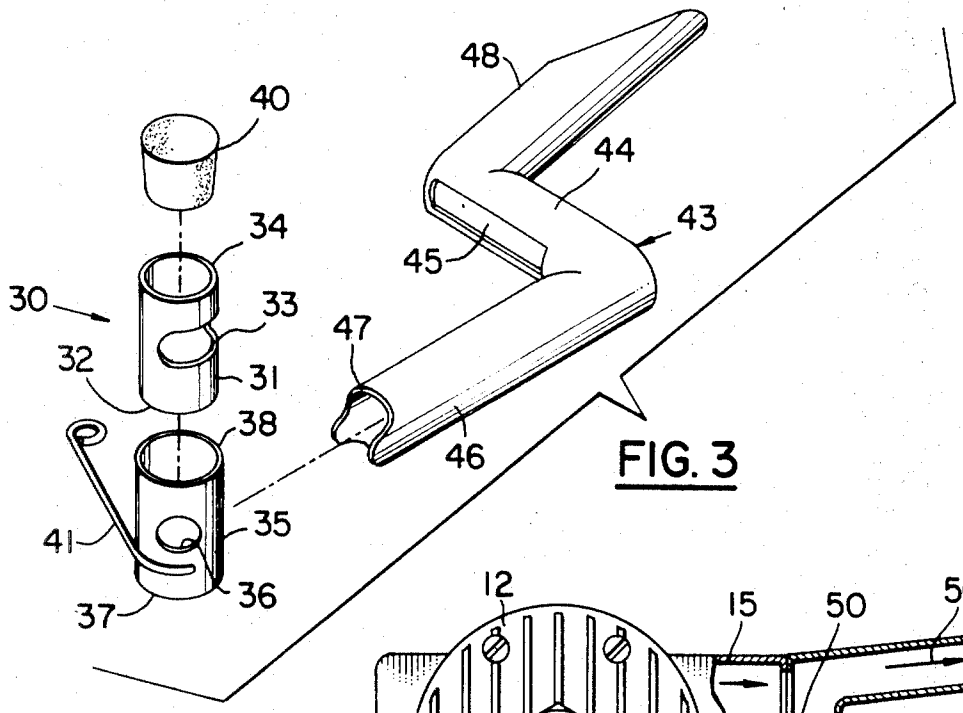


FIG. 3

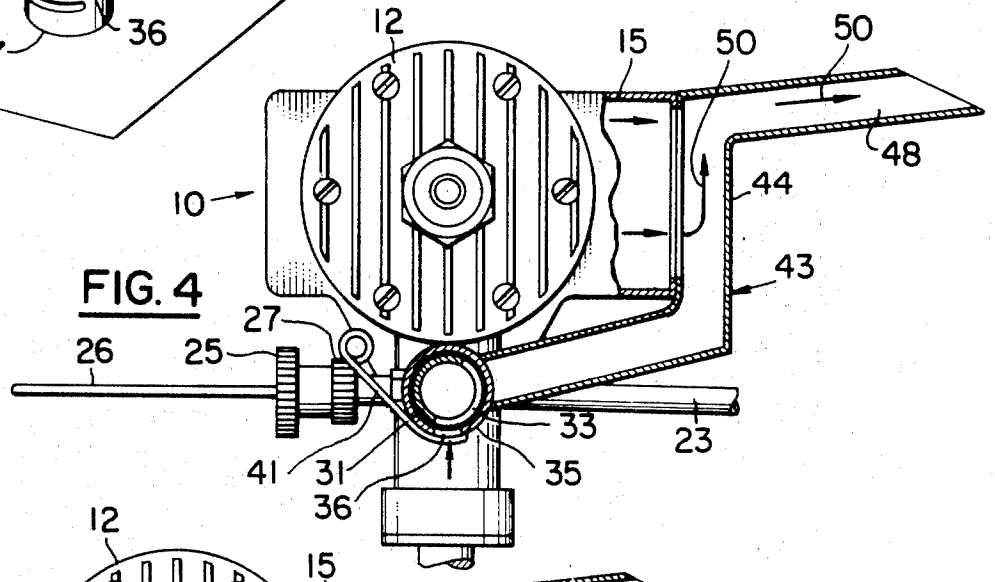


FIG. 4

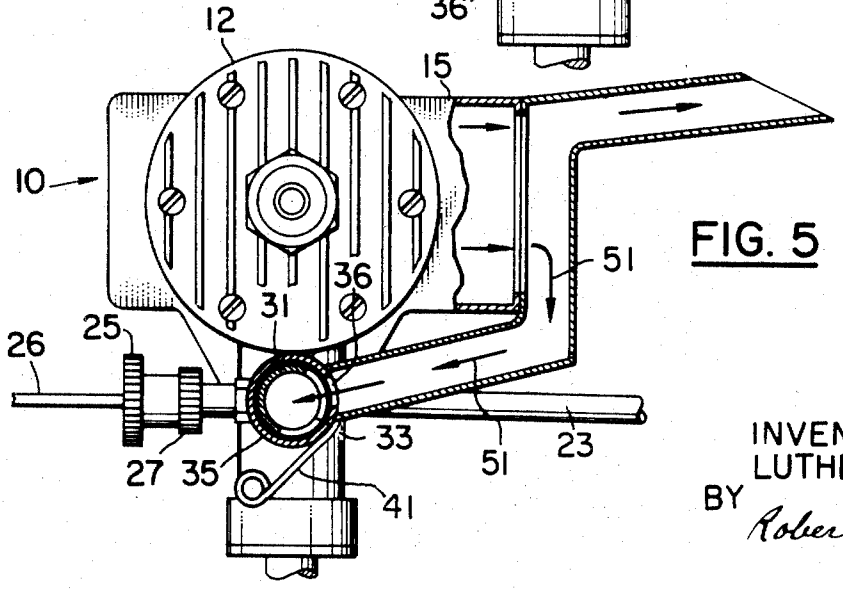


FIG. 5

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SPEED CONTROL DEVICE FOR A MODEL AIRPLANE ENGINE

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U.S. Cl. 123—98 5 Claims

ABSTRACT OF THE DISCLOSURE

The carburetor air inlet of a model airplane engine is provided with relatively shiftable inner and outer sleeves for selectively effecting communication of the air inlet with the ambient air and the engine exhaust.

BACKGROUND OF THE INVENTION

While speed control devices for internal combustion engines are not new, and have assumed many forms, there has not been provided in the past any satisfactory speed control mechanism for relatively small internal combustion engines of the type employed in model airplanes. Hence, it has been customary in the past to operate model airplane engines at full throttle without varying the engine speed.

SUMMARY OF THE INVENTION

Accordingly, it is an important object of the present invention to provide a speed control device for use with model airplane engines which can accurately vary the engine speed between full throttle and an idle speed.

It is a further object of the present invention to provide a speed control apparatus of the type described which is extremely simple in construction, requiring a minimum of parts, and conveniently operable by the user.

It is still a further object of the present invention to provide a speed control device for model airplane engines, having the advantageous characteristics mentioned in the preceding paragraphs, which is staunch and durable in construction for reliable operation throughout a long useful life, can be readily incorporated with conventional model airplane engines, either as original equipment or as an attachment, and which can be economically manufactured for sale at a reasonable price.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an end elevational view showing a model airplane engine employed in conjunction with a speed control device in accordance with the teachings of the present invention.

FIG. 2 is a top plan view of the assembly of FIG. 1.

FIG. 3 is an exploded perspective view showing the speed control mechanism of the present invention apart from the remainder of the engine.

FIG. 4 is a partial horizontal sectional view taken generally along the line 4—4 of FIG. 1, illustrating a full speed operational position of the speed control mechanism.

FIG. 5 is a horizontal sectional view similar to FIG. 4, but illustrating an idle speed position of the control mechanism.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now more particularly to the drawings, and specifically to FIGS. 1 and 2 thereof, a model airplane engine is there generally designated **10**, which may be a single cylinder engine including a cylinder block **11** provided on its upper end with a cylinder head **12**, and on its lower end with a crank case **13**. A cylinder exhaust extends laterally from one side of the cylinder block, as at **15**, and a drive shaft **16** extends from one end of the crank case **13**. The engine block **11** may be provided with lateral wings **17** for mounting the engine on a suitable bed.

Upstanding from the crank case **13** is a carburetor generally designated **20**. The carburetor may include a generally cylindrical body **21** having its lower end connected for fluid communication with the interior of the cylinder block **11** in any suitable manner. The upper end of the carburetor body **21**, as at **22**, may provide an air inlet for the carburetor. A fuel conduit **23** may be connected at one end to a fuel supply (not shown), and connected at its other end by a fitting **24**, to the interior of the carburetor body **21** for delivering fuel thereto. A needle valve **25** may be mounted in the carburetor body **21** opposite the fuel inlet fitting **24** for varying the opening thereof. That is, the needle valve **25** may be rotated by its handle **26** in opposite directions to regulate the fuel flow to the carburetor. To maintain the needle valve **25** at a selected position of its rotative movement, as for passing a desired rate of fuel to the carburetor, the needle valve may be provided with a toothed or serrated wheel **27** for rotation with the needle valve, and one or more resilient or spring fingers **28** fixed at one end to the carburetor body and in frictional bearing engagement with the wheel **27**. In this manner, the needle valve **25** is effectively held at any selected position of adjustment even under severe conditions of vibration and other motion. Of course, the needle valve **25** may serve to regulate the fuel supply and the resultant engine speed, but this mode of speed regulation is extremely limited and inconvenient.

Mounted on the body **21** of carburetor **20**, particularly on the air inlet end **22** of the carburetor body, is the speed control device of the present invention, there generally designated **30**. As best seen in FIG. 3, the speed control mechanism includes an inner sleeve **31** defined by an open ended generally cylindrical tube, which may have its lower end **32** fixedly secured to the upper end of the carburetor body **21** for fluid communication with the air inlet of the carburetor. Formed in the inner sleeve or tube **31** is an elongate opening or slot **33**. It will be observed that the elongate opening or slot **33** extends partially circumferentially about the tube **31**, approximately one-half the circumference thereof, and is spaced between the lower tube end **32** and the upper tube end **34**. As best seen in FIGS. 4 and 5, the inner sleeve or tube **31** is fixedly secured in end-to-end aligned relation with the upper or air inlet end of the carburetor body **21**, the elongate opening or slot **33** facing obliquely forwardly and laterally to the right, as shown in the illustrated embodiment.

Rotatably circumposed about the inner sleeve or tube **31**, in snug sliding relation therewith, is an outer sleeve or tube **35**. That is, the outer sleeve **35** is defined by an open ended tube rotatably surrounding the inner sleeve or tube **31** and approximately longitudinally coextensive therewith. Formed in the outer sleeve or tube **35** is a through hole **36**, which is spaced intermediate the lower and upper tube ends **37** and **38** so as to lie in facing relation with the inner sleeve opening or slot **33**. That is, the outer sleeve or tube **35** is rotatable coaxially with the inner sleeve or tube **31**; and, the generally circular outer

sleeve opening ir hole **36** is movable with the outer sleeve between a forward location, as in FIG. 4, in alignment or registry with a forward end region of the slot **33**, and a sideward location in alignment or registry with a sidewardly facing region of the slot **33**, as in FIG. 5. If desired, suitable stop means may be provided to limit rotation of the outer sleeve **31** between the extreme positions shown in FIGS. 4 and 5. Of course, the outer sleeve **31** may be placed in any selected position of rotation intermediate the extreme illustrated positions, as desired.

The upper ends of the inner and outer sleeve **31** and **35** are effectively closed by suitable closure means, such as a plug **40** engageable in the upper end of the inner sleeve. The plug or closure means **40** thus closes the upper ends of the coaxial sleeves **31** and **35**, and, by its upwardly enlarged configuration effectively retains the outer sleeve in position on the inner sleeve. An operating member or arm **41** may be fixed to the outer sleeve **35**, extending generally tangentially therefrom, for remote actuation of the outer sleeve to selectively position the latter in any desired relation with respect to the inner sleeve. Suitable remote actuating means may be connected to the operating arm **41**, if desired.

A by-pass conduit is generally designated **43**, and includes an intermediate tubular portion **44** having one side open, as at **45** for fixed securement in communicating relation with the cylinder exhaust **15**. Extending from one end of the intermediate by-pass conduit portion **44** is a conduit portion **46** which terminates in an open end **47** proximate to and facing toward the outer sleeve **35**. Further, the by-pass conduit end **47** is advantageously configured for conforming facing relation with the cylindrical exterior surface of sleeve **35** and located in alignment with the laterally facing portion of slot **33**. Extending from the other end of the intermediate by-pass conduit portion **44** is an outlet portion or tailpipe **48**. Thus, the engine exhaust **15** communicates through the side opening **45** of the by-pass conduit **43** both with the conduit **46** extending to the exterior of outer sleeve **35**, and through the tailpipe portion **48** with the ambient atmosphere.

It will now be appreciated that the conformably configured end **47** of by-pass conduit **43** is in conforming facing relation with the exterior surface of outer sleeve **35**, and that the latter is rotatable to selectively place the hole or aperture **36** in aligned registry with the conduit portion **44**, as in FIG. 5, and out of alignment therewith, as in FIG. 4. The outer sleeve **35** is thus interposed between the inner sleeve **31** and the conduit end **47**, and may be slidable therebetween.

In the condition of adjustment of outer sleeve **35** as shown in FIG. 4, it will be apparent that the hole **36** of the outer sleeve communicates between the forward region of slot **33** of inner sleeve **31** and the exterior atmosphere or fresh air. Thus, a maximum quantity of air and oxygen may be drawn into the inner sleeve **31** and to the carburetor air inlet **22** for high entrance speed. In this condition, the by-pass conduit **43** is closed by the outer sleeve **35** across conduit end **47**, so that exhaust gases proceed as indicated by the arrows **50**, all exiting through the tailpipe **48**.

In the condition of adjustment of outer sleeve **35** as shown in FIG. 5, the hole or aperture **36** is in alignment or registry with the by-pass conduit end **47**, so that the by-pass conduit communicates through the hole **36** and slot **33** with the interior of inner sleeve **31** to the air inlet of the carburetor **20**. In this condition a minimum of fresh air and oxygen may be drawn into the air inlet of the carburetor, although there may be successful operation with appreciable leakage. However, a substantial proportion of exhaust gases from exhaust outlet **15** pass in the direction of arrows **51** through by-pass conduit portion **46** and enter through hole **35** and slot **33** to the interior of inner sleeve **31**, for passage to the carburetor **20**. As this mixture of gases to the carburetor contains less oxygen, the engine speed is considerably reduced, as to an idling speed. Of course, intermediate positions of the outer sleeve **35**, as with the hole **36** partially communicating with both the by-pass conduit portion **46** and the fresh or ambient air may be employed to obtain speeds intermediate those of idling and full throttle.

From the foregoing, it is seen that the present invention provides a speed control device for a model airplane engine which fully accomplishes its intended objects and is well adapted to meet practical conditions of manufacture and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention.

What is claimed is:

1. A speed control device for a model airplane engine having a cylinder exhaust and carburetor air inlet, said device comprising an inner sleeve having one end connected in fluid communication with said air inlet, said inner sleeve having a through slot communicating between the interior and exterior of said inner sleeve, an outer sleeve slidably engaged over said inner sleeve in covering relation with said slot, said outer sleeve having a through hole movable with said outer sleeve and communicating through said slot at spaced locations thereof upon movement of said outer sleeve, and a by-pass conduit communicating between said exhaust and the exterior of said outer sleeve adjacent to one of said locations, whereby outer sleeve movement to position said hole at said one location effects communication of said exhaust with said air inlet for reducing engine speed and outer sleeve movement to position said hole at another location effects communication of fresh air with said air inlet for increased engine speed.

2. A speed control device according to claim **1**, said inner sleeve comprising a cylindrical tube, said slot being partially circumferential in extent, and outer sleeve comprising a cylindrical tube rotatably circumposed about said inner sleeve tube, said hole being located in said outer sleeve tube for rotative movement therewith between said one location communicating with said by-pass conduit and said other location communicating with ambient air.

3. A speed control device according to claim **2**, in combination with closure means closing said inner and outer sleeve tubes remote from said air inlet.

4. A speed control device according to claim **3**, said by-pass conduit having one end configured for conformance with said outer sleeve tube.

5. A speed control device according to claim **3**, in combination with an operating arm connected to said outer sleeve tube for selective positioning of the latter.

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