D. W. McLEAN.

GENERATOR.

APPLICATION FILED OCT. 12, 1920.

1,385,257.

Patented July 19, 1921.

2 SHEETS—SHEET 1.

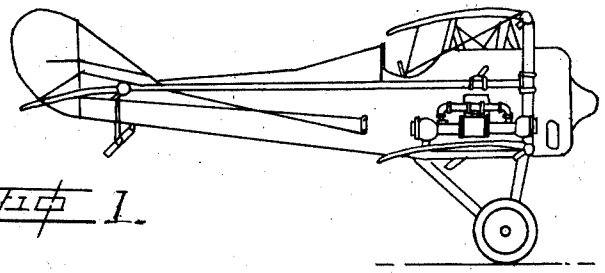


FIG. 1.

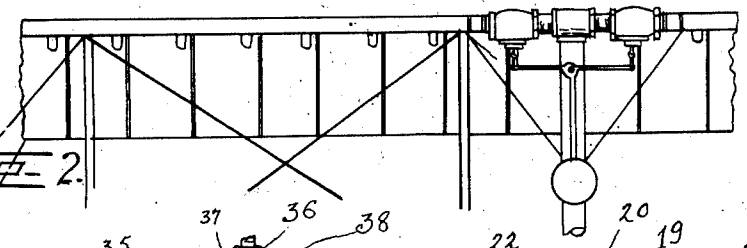


FIG. 2.

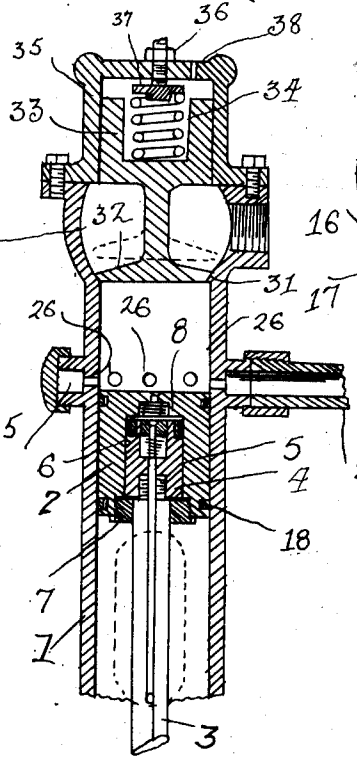


FIG. 3.

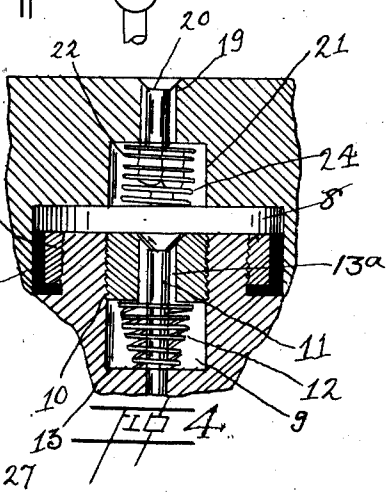


FIG. 4.

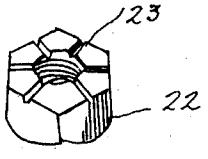


FIG. 5.

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2 SHEETS—SHEET 2.

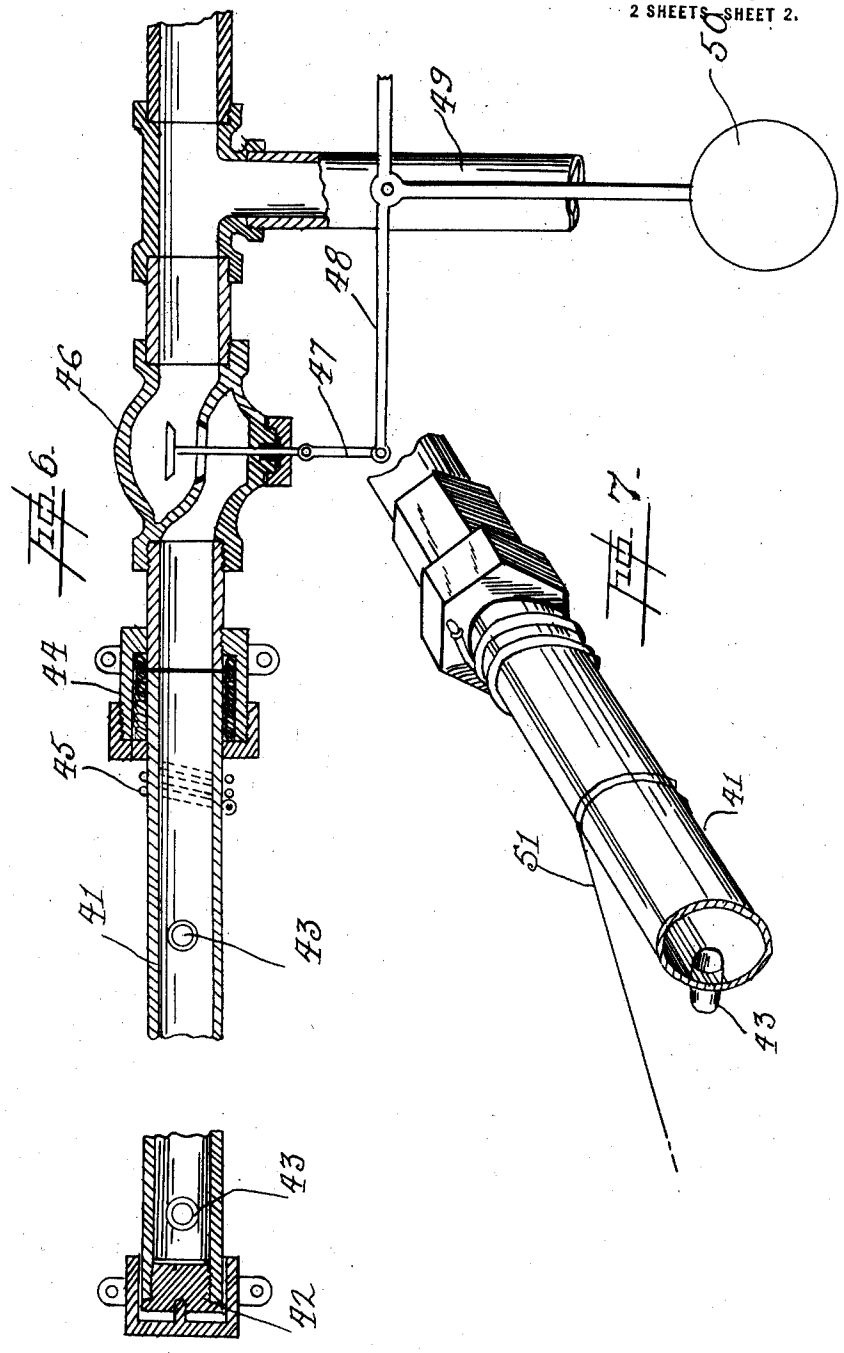


FIG. 6.

FIG. 7.

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UNITED STATES PATENT OFFICE.

DONALD W. McLEAN, OF GLENCOE, ONTARIO, CANADA.

GENERATOR.

1,385,257. Specification of Letters Patent. Patented July 19, 1921.

Application filed October 12, 1920. Serial No. 416,484.

To all whom it may concern:

Be it known that I, DONALD W. McLEAN, a citizen of the Dominion of Canada, residing at Glencoe, in the county of Middlesex and Province of Ontario, Canada, have invented certain new and useful Improvements in Generators, of which the following is a specification.

This invention relates to generators adapted for use on aeroplanes and the like, and the objects of the invention are to permit of a reaction force being utilized as a raising or driving power as well as a stabilizer, tending to bring an aeroplane to an even keel when flying straight forward, so that tipping of the aeroplane laterally will be readily rectified, to simplify the construction of the generator rendering it durable, light, cheap to manufacture and generally efficient.

In order to give an understanding of my invention, I have illustrated in the drawings some selected embodiments thereof, which will now be described, after which the novel features will be pointed out in the appended claims.

Figure 1 is a side elevation of an aeroplane having my invention installed thereon.

Fig. 2 is a front elevation of a plane showing the hollow spars to which the superheated steam and products of combustion are delivered, and the valve means controlling the flow of fluid to the spars.

Fig. 3 is a sectional elevation of part of my generator showing the gas and water pistons and the outlet valve.

Fig. 4 is an enlarged fragmentary section of the gas and water pistons showing the valves therein.

Fig. 5 is a perspective view of the nut adapted to be secured to the valve of the gas piston.

Fig. 6 is a longitudinal section of one of the spars showing the valve mechanism controlling the supply of fluid to the spars.

Fig. 7 is a perspective view of a portion of one of the spars.

Like symbols are used to indicate corresponding parts throughout the drawings.

Referring to the drawings, A represents the improved generator comprising a cylinder or cylinders 1, arranged in alinement, and between these cylinders a prime mover and valve gear 2 is located, but this prime mover and valve gear does not form part of the present invention and consequently is not described.

A piston rod 3 passes through the casing of the prime mover 2 and is formed with reduced ends which are threaded at 4 and these threaded ends are screwed into a water piston 5.

This water piston fits within a gas piston 6 and is retained therein by an adjustable nut 7 and a water space 8 is left between the inner end of the gas piston 6 and the water piston 5.

In the water piston 5 a recess is formed in the inner end as indicated at 9, and a valve seat 10 is screwed into the end of this recess and a valve 11 engages with the valve seat and has its stem extending through the same.

A spring 12 encircles the stem of the valve and engages with the inner face of the valve seat 10 and with a pin which extends through the valve stem. The recess 9 forms a chamber which is in communication with the bore hole 13^a extending through the piston rod 3 and the outer end of this bore hole is designed to be connected to a rubber tube which is attached to a water tank.

A collar 16 is threaded around the inner end of the water piston 5 and engages with a packing member 17, so that the water piston makes a water tight joint with the gas piston 6.

The gas piston 6 is fitted with rings 18 so that it makes a gas tight engagement with the cylinder 1, and on the inner end of the gas piston 6 a valve seat 19 is provided with which the valve 20 engages.

A recess 21 is formed in the gas piston 6 to accommodate a nut 22 which is screwed on the stem of the valve 20, and this nut is provided with a series of radial grooves 23 to allow water to pass by the nut and through the valve seat into the cylinder.

The spring 24 which encircles the nut 22 controls the closing of the valve 20.

The cylinder 1 is provided with a gas chamber 25 around its outer wall, and this gas chamber communicates with the cylinder through ports 26, and the gas chamber is connected by a pipe 27 with the carbureter which is attached to the gasolene tank.

On the end of each cylinder 1 an exhaust chamber 30 is provided and formed with a valve seat 31 with which the valve 32 engages, and this valve is provided with an

outer piston end 33 having a recess therein to accommodate a spring 34. A cover 35 fits over the piston 33 and is secured to the exhaust chamber 30 by bolts or other fastening means.

Through the end of the cover an adjustable screw 36 extends and engages with a plate 37 which bears against the spring 34, and the cover is provided with a vent 38.

The exhaust chamber 30 is connected to a pipe which communicates with the hollow members 41 and delivers a mixture of superheated steam and products of combustion to the said hollow members. A detail of the hollow members is shown in Figs. 6 and 7.

The hollow members 41 are closed at one end by a cap 42 and are provided with a number of nozzles 43, and the hollow members are sectional, the outer section being connected to the inner section by a stuffing box mechanism 44, and a spring is coiled round the outer section and has one end attached to the said outer section and the other end attached to the stuffing box. This spring is indicated at 45.

On the inner section of the hollow members which do not rotate, valves 46 are provided and these valves are controlled by links 47 and a T-shaped lever 48 which is pivoted to the supply pipe 49 of the hollow members.

The T-shaped lever 48 has a weight 50 on the end of its vertical member.

The movable outer section of the hollow member 41 has a wire 51 coiled therearound, and when the wire is pulled, the outer section of the hollow member will rotate so that the nozzle 43 will be disposed in the proper direction.

When the generator is being used, the piston rod 3 is reciprocated, and water flows from the tank 15 through the tube 14 to the bore hole 13, and enters the recess 9, and on the inward stroke of the gas and water pistons 6 and 5, a vacuum is created in the space 8 and the valve 11 is unseated and water fills the said space.

When the piston 6 reaches the inner end of its stroke, the ports 26 are uncovered and gasolene flows from the tank 29 to the carbureter 28 and through the pipe 27 to the chamber 25, then through the ports 26 into the cylinder.

On the return stroke of the pistons 6 and 5, the water is compressed in the space 8 and the gasolene which has been vaporized is compressed in the cylinder up to a pressure at which it ignites, and the pressure of the water unseats the valve 20 and sprays the water into the cylinder where it absorbs the heat of the burning gasolene, vaporizes the water and forms superheated steam which will have the products of combustion of the gasolene suspended therein.

When the piston 6 is reaching the end of its stroke, it unseats the valve 32, and the superheated steam and products of combustion pass into the exhaust chamber 30, and through the pipe 40 to the non-rotatable portion of the members 41, where the superheated steam passes through the valves 46 to the movable portions of the members and is discharged through the nozzles 43.

On the inner stroke of the pistons 6 and 5, the valve 32 is re-seated by the spring 34 and the operation of receiving water into the water space 8 is repeated, while gasolene in a vaporized form will be delivered to the cylinder when the piston 6 has reached the inner end of its stroke.

The vaporizing of the water and the formation of steam takes place on the outer stroke of the pistons as has been described above.

Should an aeroplane on which this device is installed be flying forward in a straight course, and tip sidewise, then the T-valve 48 will be held in a true vertical position by gravity, and the valve 46 on the highest side of the member will be closed shutting off the superheated steam from the member and allowing the steam to be delivered only to the lower portion of the member, from which it will be discharged through the nozzle 43 and will act as a stabilizer and return the aeroplane to a normal horizontal position.

When the aeroplane returns to its horizontal position, the T-shaped lever 48 will automatically open both valves 46 so that the steam is now delivered to both sides of the member.

By means of the wire 51, the nozzles can be turned in any desired direction. If desirous of rising, the nozzle will be turned downwardly so that the gases discharged therefrom will raise the aeroplane. When raised they may be tilted rearwardly and slightly downwardly and in this position will give a forward driving power. In turning, the nozzles on the inner side can be directed slightly more in a downward direction than those on the outer side and in this way the aeroplane will be held in a horizontal position while the outer nozzles being directed rearwardly will bring the outer side around to turn the curve as desired.

What I claim as my invention is:

1. In a generator a cylinder, a pair of pistons one operating within the other, a water space between the pistons, one of the pistons being designed to compress vaporized gasolene to an ignition point, and the second piston to deliver compressed water to the burning gasolene to absorb the heat therefrom and vaporize the water substantially as described.

2. In a generator, a cylinder, an exhaust chamber on the end of the cylinder, a valve operating in the exhaust chamber, a pair of

pistons slidable in the cylinder, one piston being located within the other, means for delivering water to a space between the pistons, and means for delivering gasolene to the cylinder.

3. In a generator, a cylinder and exhaust chamber on the end of the cylinder, a valve operating in the exhaust chamber, a pair of pistons slidable in the cylinder, one piston being located within the other, a valve in one piston, a valve in the second piston, means for delivering water to a space between the pistons, and means for delivering gasolene to the cylinder.

4. In a generator a cylinder, having a gas chamber communicating with the cylinder through ports, an exhaust chamber on the end of the cylinder, a valve operating in the exhaust chamber, a pair of pistons slidable within the cylinder, one piston being located within the other, means for delivering water to a space between the pistons, and means for delivering water under pressure from the said space to the cylinder to mix with burning oil and absorb heat therefrom and generate steam.

5. In a generator, a cylinder, an exhaust chamber in the end of the cylinder, a valve in the exhaust chamber, a spring engaging with the valve and designed to close the same, a pair of pistons slidable in the cylinder, one piston being located within the other, means for delivering water to a space between the pistons and means for delivering gasolene to the cylinder.

6. In an aeroplane, hollow members adjacent to the planes formed in sections, one section rotatable and the other section non-rotatable, resilient means connecting the two sections, nozzles on the rotatable section, and a generator adapted to deliver steam to the hollow members to act as a stabilizer.

7. In an aeroplane, hollow members adjacent to the planes, nozzles on the hollow members, valves intermediate of the length of the hollow members, a weighted T-shaped lever controlling the operation of the valves, and a generator adapted to deliver steam to the hollow members to act as a stabilizer.

8. The combination with an aeroplane, of a generator system, hollow members located adjacent to the planes and in communication with the generator system, the members being sectional and formed of non-rotatable and rotatable sections, the rotatable sections having nozzles thereon, the fluid generated by the generator system being delivered to the members to primarily transmit a lifting force to the aeroplane, and means for rotating the rotatable sections of the members whereby the said force will subsequently be transformed to a driving force.

9. The combination with an aeroplane, of hollow members located adjacent to the planes, the members being sectional and formed in non-rotatable sections and rotatable sections, nozzles on the rotatable section, means for delivering a fluid under high pressure to the hollow members, means for rotating the rotatable member of one plane in one direction to dispose the nozzles in a predetermined direction, and means for rotating the rotatable member of another plane in another direction with the nozzles disposed angularly to the nozzles of the first said section whereby a turning of the aeroplane is accomplished.

In testimony whereof I affix my signature in the presence of two witnesses.

DONALD W. McLEAN.

Witnesses:
W. D. Moss,
ELEANOR McINTYRE.