April 16, 1935. A. ARCIERI 1,997,669

AEROPLANE ATTACHMENT FOR EXTINGUISHING FIRES

Filed Feb. 23, 1934

Fig. 1.

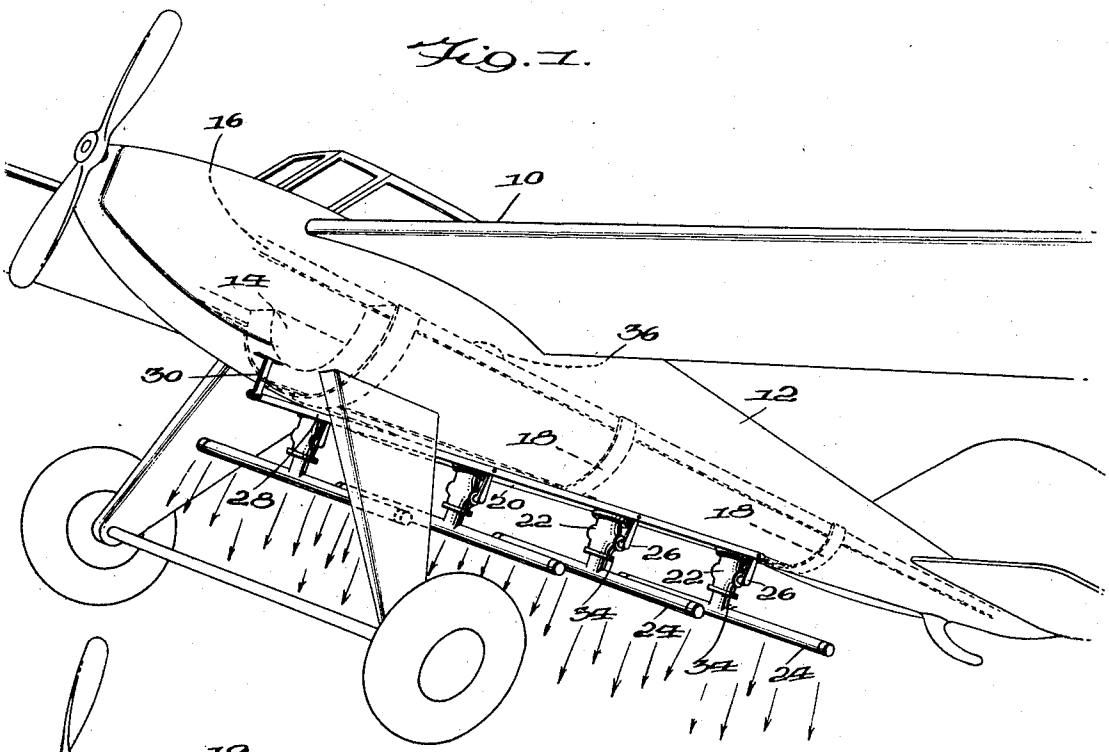


Fig. 2.

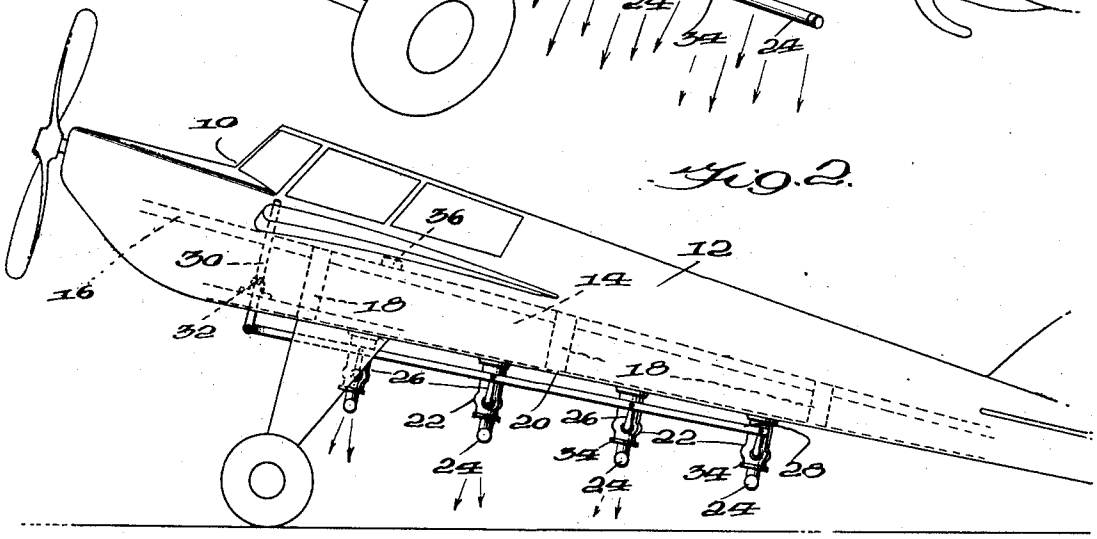
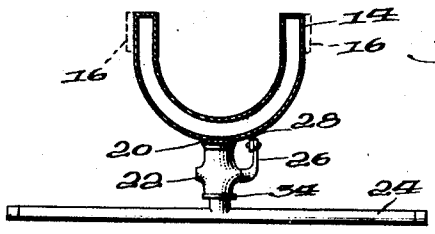


Fig. 3.



Inventor

Antonio Arcieri,

By Riordon & Riordon

Attorneys

Patented Apr. 16, 1935 1,997,669

UNITED STATES PATENT OFFICE

1,997,669

AEROPLANE ATTACHMENT FOR EXTINGUISHING FIRES

Antonio Arcieri, West Hollywood, Calif.

Application February 23, 1934, Serial No. 712,629

3 Claims. (Cl. 244—1)

The present invention relates to apparatus for distributing a fire preventing and extinguishing composition and more particularly to an attachment for aeroplanes by means of which a fluid composition such as water or suitable fire extinguishing chemical may be transported by aeroplane to the scene of the fire and released from the moving aeroplane for the purposes described.

Broadly this invention comprises a storage tank and spraying means carried by the aeroplane, the apparatus being situated in such a manner as to affect but slightly, if at all, the gravity and balance of the machine under flying conditions. It is desirable that the tank be built into the machine in such a manner as to form a part of the fuselage thereof, whereupon it will not be distinguishable from the exterior of the machine. The spraying means and suitable control valves are provided externally of the tank and fuselage, such valves being controlled by means located within easy reach of the pilot of the ship.

This apparatus and means of fire fighting is especially advantageous in fighting forest, grass or grain fires, and has many decided advantages over the ordinary apparatus usually employed in such emergencies, such as providing the fire fighters with an elevated point of observation, speedy means for change of field of action and facilities for rapidly covering large areas effectively.

Among the objects of the invention is the provision of means for showering or spraying the fire preventing and extinguishing medium upon wooded, or other areas, either as a precaution against fires, or for their extinguishment should they have started.

The invention is particularly useful to members of the Forestry Service who supervise a large territory and with any available body of water the Forestry Service will have at its command means for transporting a considerable quantity of water to a small or starting fire, and for directing the discharge of water, or for that matter any fire extinguishing compound found suitable, as an aid in extinguishing the fire.

In addition to the fire extinguishing capabilities of my invention, the aeroplane equipped with the tank and the latter filled with a liquid insecticide, may be utilized for spraying growing crops and orchards in order to destroy insects, scale and the like, also the equipped aeroplane may be used for transporting water, gasoline or oil to disabled ships or hydroplanes at sea or disabled aeroplanes that have been forced to land at points inaccessible to motor trucks or other land vehicles.

Further, the equipped planes may be utilized for transporting water or the like to troops or expeditions that may have been stopped in deserts for the lack of water, gasoline or the like.

The liquid containing tank which is located wholly within and forms a part of the frame structure of the aeroplane fuselage, may be filled with gasoline to provide a reserve supply in the event of an extended flight and with the tank emptied or partially emptied of its contents will render the plane buoyant in the event that the operator of the plane is forced to make a landing at sea.

To the attainment of the foregoing and other objects which will appear as the description proceeds, reference may be made to the accompanying sheet of drawings, in which:

Fig. 1 is a perspective view of an aeroplane mounting the apparatus of the invention;

Fig. 2 is a side elevation showing structural details of the apparatus; and

Fig. 3 is an elevation, partly in section, of the tank and one spray valve.

Referring more particularly to the drawing in which like reference numerals designate like parts, it will be observed that **10** indicates an ordinary aeroplane comprising wings, and a fuselage **12**, the fuselage being equipped with the conventional landing gear and provided with space in its forward portion for the motor and pilot's cockpit and ship controls. The aeroplane may be of any conventional type.

A tank **14** of generally U-shaped configuration is provided, the exact shape of the tank depending upon the shape of the lower and rear portions of the fuselage. This tank will be mounted wholly inside of, and extends longitudinally of the fuselage, being held in position by the side rails **16** which may well be a portion of the fuselage framework, or which may be added for the purpose of supporting the tank.

Inasmuch as the tank is located wholly inside the fuselage, it does not in any way interfere with the stream lining of the fuselage and does not provide resistance to air during flight of the equipped plane.

Further, the location of the tank within the fuselage and the shaping of the tank enables the tank structure to be readily combined with and form a part of the frame structure of the fuselage, thereby materially increasing the strength and stability of the latter.

Running transversely of the fuselage in close

proximity to the lower walls thereof, are series of strap members 18, extending from one rail 16 to the other, and forming, with the rails, a cradle-like support for the tank 14. The tank will, of course, be suitably secured in position. The tank 14 may be of any convenient size depending upon the nature and size of the flying machine to which it is attached, but will preferably be large enough to contain at least one hundred gallons of water or other fire extinguishing fluid. Thus a tank 4' by 5' and having a space between walls, throughout its configuration, of approximately one foot will hold approximately one hundred gallons of water, with a gross weight of approximately eight hundred pounds. By extending the length of the tank to 7½', one hundred and fifty gallons, grossing twelve hundred pounds can be accommodated. This size may be varied in shape and capacity to accord with the size and style of the machine. The shape of the tank, in addition to its general U-configuration will, of course, be somewhat tapered towards the rear end thereof to conform to the tapering shape of a conventional fuselage.

Extending longitudinally of the tank and fuselage, and exteriorly of the tank, there will preferably be located an elongated strap-like member 20. This member performs several functions, such as forming a bottom support for the tank, and a reinforcing means for carrying the valves 22, and may well be built in as a part of the ship itself, although this is not essential.

Any number of valves 22 will be provided, these valves being tapped directly into the tank through the strap 20, and extending outwardly through the fuselage to mount respectively a series of spray nozzles 24.

Operating arms 26 will be provided for the respective valves, these arms being each connected to a single operating link 28 extending lengthwise of the ship. At the forward end of the link 28 is an actuating lever 30 which extends into proximity of the pilot's seat in the cockpit. This lever 30 will be fulcrumed at 32 and will serve as a ready means for opening and closing all the valves simultaneously.

Obviously the valves and valve operating mechanism may be arranged so that any one of the valves may be opened or closed independently of the others.

Although each of the valves 22 is shown as terminating in a spray nozzle, it will be evident that should conditions warrant, the nozzles 24 may be dispensed with and thus a heavy, confined stream of fluid projected from the valves.

Obviously the arrangement of valves is such that the nozzles will be sufficiently close to the under side of the ship as to clear the ground at all times, the landing gear projecting beyond the lowermost nozzle and valve.

Adjustment of the nozzles may be effected in any desirable manner, the simplest method being merely to screw thread the nozzles into the body of the valve 22 and hold them in adjusted angular position by means of lock washers 34.

From the foregoing description the use and operation of the device may be readily apparent. Having discovered a fire, the aviator may fly to a vantage point thereover and by suitable manipulation of the control 30, spray the fire extinguishing fluid thereupon, the spray nozzles giving the effect of rain. In the case of a relatively concentrated fire, the spray nozzles may be removed and a concentrated stream of water or chemical projected thereon.

Obviously, any suitable filling medium such as the filler neck 36 may be provided.

If found more convenient, a series of small detachable tanks placed in end to end relation might be utilized in lieu of a single large tank, an advantage being in facile replacement, filling, etc., but the preferred form of a single tank is suggested for simplicity and economy in manufacture and assemblage.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:—

1. In a device of the character described, the combination with a flying machine having a fuselage, of a tank conforming to the internal characteristics of said fuselage, and mounted wholly therein, said tank having outlets projecting exteriorly of the fuselage, a cradle formed of longitudinally extending rail members and transversely extending strap members conforming to the external characteristics of the tank and having their ends connected to said rail members, said cradle being positioned between the walls of the tank and the fuselage and effective to support same in position.

2. In a device of the character described, the combination with a flying machine having a fuselage, of a tank conforming to the internal characteristics of said fuselage, and mounted wholly therein, said tank having outlets projecting exteriorly of the fuselage, a cradle formed of longitudinally extending rail members and transversely extending strap members conforming to the external characteristics of the tank and having their ends connected to said rail members, said cradle being positioned between the walls of the tank and the fuselage and effective to support same in position, said exteriorly projecting portions comprising valves and control means therefor.

3. In a device of the character described, the combination with a flying machine having a fuselage, of a cradle comprising rails extending along said fuselage on the interior thereof, and transversely extending straps shaped to conform to predetermined internal characteristics of the fuselage, said rails and straps being positioned in proximity to the walls of the fuselage, a tank mounted in said cradle and having walls shaped to conform to the interior of the fuselage, a longitudinally extending strap member at the bottom exteriorly thereof and providing a reinforcement for the tank, said tank having outlets projecting through said longitudinally extending member to a location exteriorly of the fuselage, said exteriorly projecting outlets comprising valves, and control means for said valves extending in proximity to the flying machine controls.

ANTONIO ARCIERI.