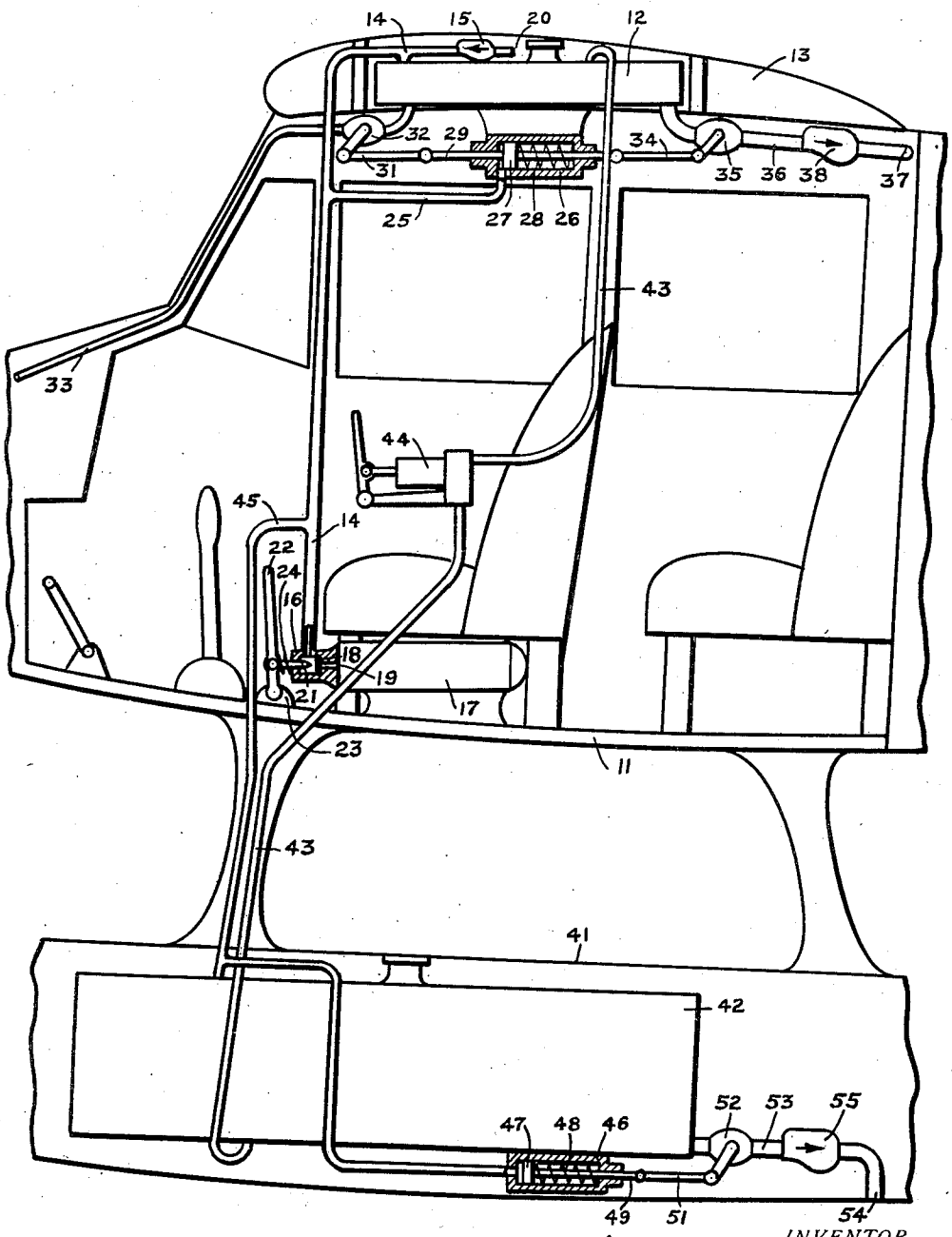
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GAS TANK DISCHARGEER FOR AIRPLANES

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GAS TANK DISCHARGER FOR AIRPLANES

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2 Claims. (Cl. 244—31)

This invention relates to the evacuation of fluid containers and more particularly to improved means for discharging the contents of a tank in the shortest possible time and to decrease fire hazard.

The invention more specifically shows means for dumping the gasoline from the fuel tank of an airplane by the application of high pressure to said fuel tank and at the same time means are provided for opening the dump valve and for shutting off the supply of fuel to the engine.

The invention also consists in certain new and original features of construction and combinations of parts hereinafter set forth and claimed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, the mode of its operation and the manner of its organization may be better understood by referring to the following description taken in connection with the accompanying drawing forming a part thereof.

The single figure of the drawing discloses the device applied to a seaplane.

In the following description and in the claims, parts will be identified by specific names for convenience, but they are intended to be as generic in their application to similar parts as the art will permit.

Referring more particularly to the accompanying drawing an airplane 11 is provided with the usual fuel tank 12, located in the center section of the wing 13. The top of the tank 12 is connected to a branched pipe 14, the end of one branch being connected to a check valve 15, so that air can pass in the direction of the arrow only. The other side of the check valve is vented at 20.

The other branch of the pipe 14 is connected to a valve 16 mounted on the end of a pressure cylinder 17, which contains fluid under high pressure, such for example as carbon dioxide gas, or some other non-inflammable gas.

This valve is provided with a rigid diaphragm 18, which normally closes the opening 19 of the pressure cylinder 17. Slidably mounted in the valve 16 is a pointed plunger 21 which is pivoted to a lever 22. This lever is rotatably mounted on a bracket 23, secured to the fuselage of the airplane. Surrounding the plunger 21 is a compression spring 24, which normally holds this plunger out of engagement with the diaphragm 18.

The pipe 14 is connected by a branch pipe 25, to one end of a cylinder 26 of a servo-motor. This cylinder is provided with a piston 27 which is normally held at the left-hand end of this cylinder by means of a compression spring 28. Secured to the piston 27 is a piston rod 29, one end of which is connected by a link 31, to the arm of a valve 32, which is mounted in the fuel supply line 33, which is connected to the carburetor (not shown) of the engine.

The other end of the piston rod 29 is connected by a link 34, to the arm of a valve 35, which is mounted in a large pipe 36, one end of which is connected to the tank 12 and the other end of which is connected to a vent 37 outside of the cabin of the plane. Mounted in the pipe 36 is a check valve 38 which allows the passage of fluid in the direction of the arrow only.

Located in the pontoon 41 is an auxiliary gasoline tank 42. This tank is connected by a pipe 43 to the fuel tank 12. In this line is a hand pump 44 located adjacent the pilot's seat, so that the pilot may replenish the supply of gasoline in the tank 12 from the auxiliary tank 42 when necessary.

The pipe 14 is connected by a branch pipe 45 to the auxiliary tank 42, and to the end of a cylinder 46 of a servo-motor, which is provided with a piston 47. This piston is normally held at the left hand end of this cylinder by means of a compression spring 48. Secured to the piston 47 is a piston rod 49, which is connected by a link 51 to the arm of a valve 52, which is located in a large pipe 53, which connects the auxiliary tank 42 with a vent 54. A check valve 55 is also located in this pipe and allows fluid to pass only in the direction of the arrow.

In the operation of the form of the invention shown in the accompanying figure, the valve 32 is normally open, and the valves 35 and 52 normally closed. As the fuel in the tank 12 is used up, air enters the vent 20, passing through the check valve 15, and pipe 14, to the tank 12. When the fuel in the tank 12 becomes low, the pilot operates the hand pump 44 to pump gasoline from the auxiliary tank 42 to the tank 12.

If, for any reason, it is necessary to make a forced landing, and the pilot desires to quickly discharge the gasoline from the tanks 12 and 42, he pulls back on the lever 22, thus causing the plunger 21 to puncture the diaphragm 18 which allows the fluid, under pressure, in the cylinder 17, to pass into the pipe 14, thence through pipes 25 and 45 to the left-hand sides of the cylinders 26 and 46. This causes the pistons of these cylinders to be quickly moved to the right, thus ro-

tating the valves 32, 35, and 52 in a counter clock-wise direction. This causes the valve 32 to be closed, thus cutting off the supply of fuel to the carburetor of the engine, and opens the valves 35 and 52, thus connecting the tanks 12 and 42 to the vents 37 and 54. At the same time, the fluid under pressure passes to the tanks 12 and 42 thus forming a pressure in these tanks which causes the rapid discharge of the fuel through the pipes 36 and 53. The fluid under pressure from the cylinder 17 cannot escape to the atmosphere through the vent 20, due to the closing of the check valve 15. The check valves 38 and 55 are provided so that in case the plane is forced down upon the water, the water will not tend to flow back into the tanks, thus decreasing the buoyancy of the plane.

Any suitable and well known means may be provided for preventing the formation of ice or carbon dioxide snow in the pipes, fittings and valves, if necessary.

Although only a few of the various forms in which this invention may be embodied have been shown herein, it is to be understood that the invention is not limited to any specific construction, but might be embodied in various forms without departing from the spirit of the invention or the scope of the appended claims.

What is claimed is:

1. In a liquid fuel system for airplanes, a fuel tank, a supply line leading from said tank to the airplane engine, a valve in said supply line, an auxiliary fuel supply tank, vent pipes on both said tanks, valves in said vent pipes, servo-motors controlling said supply and vent valves, a control pipe having branches connected to the tops of both said tanks and to said servo-motors, a cylinder of compressed carbon dioxide connected to said control pipe, a rigid diaphragm separating the passages in said control pipe and cylinder, a plunger arranged to puncture said diaphragm and a lever within the pilot's compartment for operating said plunger to puncture said diaphragm, whereby the carbon dioxide will expand into said control pipe to apply pressure above the fuel in both said tanks and to operate said servo-motors to close said supply valve and to open said vent valves.

2. A device for rapidly emptying the fuel tank of an airplane in flight, comprising a dump valve for said tank, a source of non-inflammable gas under pressure on said airplane, means to release said gas from said source, means actuated by said released gas to open said dump valve, and means to simultaneously supply said released gas to said tank to accelerate discharge of said fuel, whereby the tank is filled with non-inflammable gas as the fuel is discharged.

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