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F. B. ALLEN

2,425,778

FIRE EXTINGUISHING SYSTEM

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Fig. 1.

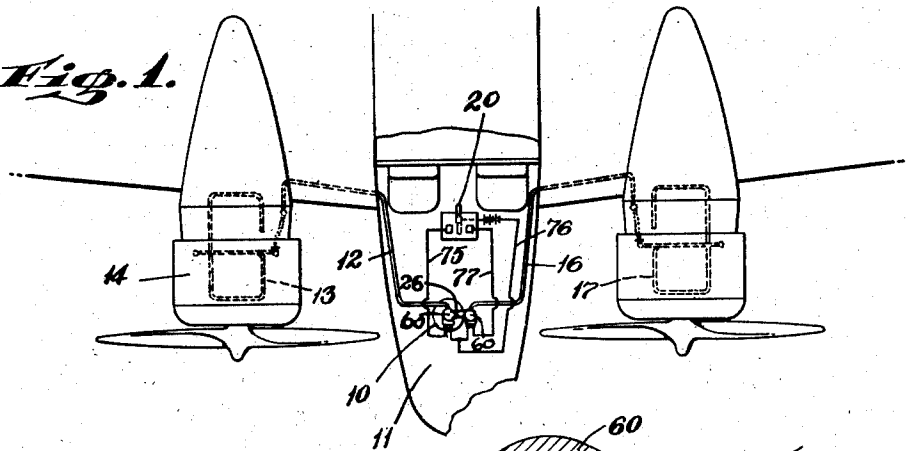


Fig. 3.

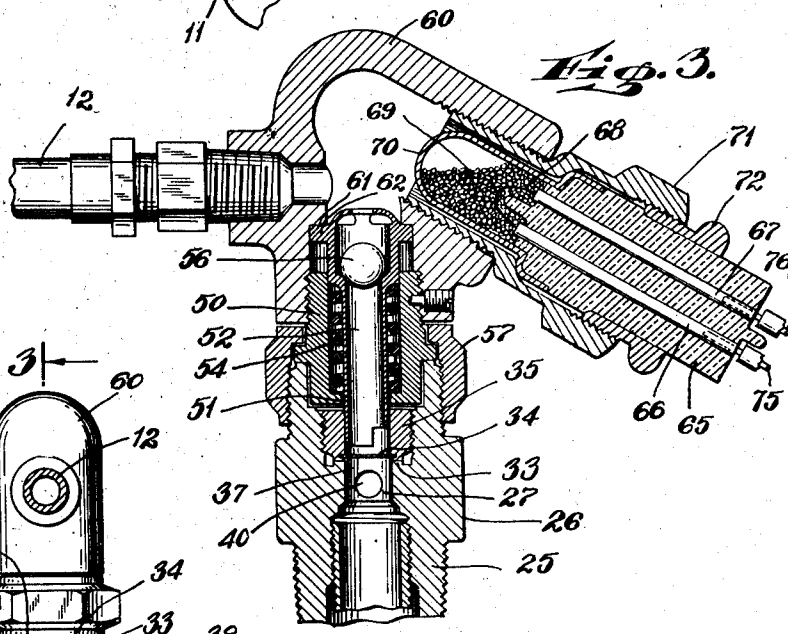
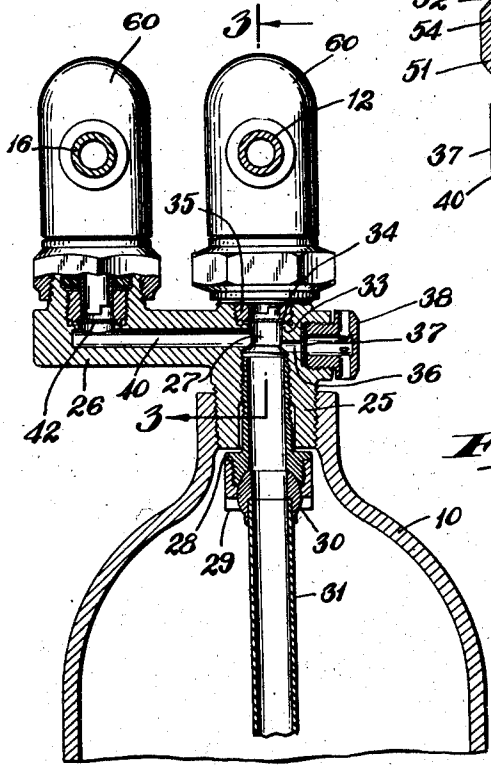


Fig. 2.



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FIRE EXTINGUISHING SYSTEM

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1 Claim. (Cl. 169—2)

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This invention relates to a fire extinguishing system especially designed for use in airplanes although not limited to such use. Prior systems include a high pressure fluid container, a discharge conduit connected thereto and a two way valve for directing the discharging fluid from the discharge conduit to either of the perforated discharge tubes or the like in the right and left hand engine compartments and the container is equipped with a discharge head provided with a mechanically operated sealing disc cutter operated by cables directed over rollers or pulleys and these constructions include a handle which is turned toward the engine in trouble to operate the two way valve to direct the fluid to that engine and which is given a short pull to operate the cutter. In certain instances this manipulative means is mounted on the instrument panel and in others on the floor of the pilot's cabin. Two operations are required to release the fluid and direct it to the proper engine compartment.

Among the objects of this invention are the provision of means by which only a single manipulative operation is required for releasing the fire extinguishing fluid and directing it to the desired engine compartment thereby simplifying the construction and saving time in effecting the discharge of the fluid and also eliminating the necessity of using cable rollers or pulleys or the like and permitting the ready mounting of the container in any desired position in the fuselage.

Other objects of the invention will appear from the following description taken in connection with the drawings, in which—

Fig. 1 is a diagrammatic top plan view of a twin engine airplane, showing the system embodying my invention diagrammatically;

Fig. 2 is a vertical section through a container and my improved fitting;

Fig. 3 is a vertical section on the line 3—3 of Fig. 2.

As indicated in Fig. 1 the container 10 and parts connected thereto are mounted in the fuselage 11 being herein shown as mounted in vertical position but it is to be understood that the container may be mounted to lie horizontally and in any available space for example below the floor in the pilot's cabin, and may be connected by a conduit 12 to discharge tubing 13 perforated to distribute gas throughout the right hand engine compartment 14 and this tubing if desired may include a large loop encircling the engine and a smaller loop encircling the carburetor having its end fitted to the air intake of the carburetor, and

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the container may also be connected by a conduit 16 to a similar discharge tubing 17 in the left hand engine compartment. As will be described later the fire extinguishing fluid may be discharged into either of the engine compartments under control of a two-way switch lever 20 accessible to the pilot to close either one of two circuits connected to firing apparatus operating to perforate sealing discs opening a passageway for the fluid through either one of the conduits to the respective discharge tubing and engine compartment.

As disclosed in Fig. 2 the container 10 is provided with a neck threaded interiorly to receive a threaded projection 25 on a fitting 26 of special construction for the purposes of carrying out the objects of this invention. The fitting 26 is provided with a discharge bore 27 which extends axially of the threaded projection 25 and it is interiorly threaded to receive one element 28 of a syphon tube supporting means, the other element being indicated at 29. The two elements together are provided with a spherical seat to receive the spherical end 30 of a syphon tube 31 in order that the syphon tube may be positioned to extend vertically as shown in Fig. 2 when the container is set upright or to incline toward the lower side of the container in case the container is laid on its side.

The discharge bore 27 referred to extends up through the fitting 26 where it is provided with a seat 33 for a puncturable sealing disc 34 which is held on the seat by means of a threaded tubular member 35 as is well known in this art. Extending laterally from the discharge bore 27 below the sealing disc is a safety port 36 which is normally closed by a safety disc 37 held in place by a ported plug 38. The fitting also is provided with the usual filling port not disclosed which is used for filling the container and for recharging it. Another port 40 extends laterally from the bore 27 and then upwardly and is enlarged to provide a seat for a puncturable sealing disc 42 held in place by a threaded tubular member of identical construction with the one previously described.

The discharge heads for the puncturable discs 34 and 42 are of identical construction and comprise only the well known details of construction. Each head includes a hollow cylindrical body 50 having a hole 51 in its lower end wall to slidably receive a cutter or puncturing element 52 in the form of a piston which is normally held in the position shown in Fig. 3 by means of the spring 54 interposed between shoulders on the piston and the lower end wall of the cylinder 50. The

bore of the piston is provided with a seat for a downwardly seating ball valve 56. A flanged cylindrical clamping nut 57 is provided to engage a flange on the cylinder 50 to secure the cylinder in position on the fitting 26.

The discharge head is provided with a cap or head 60 threaded on the cylinder 50. The cap is provided with a shoulder 61 to engage a shoulder 62 on the piston and limit its upward movement. Connected to each of the caps 60 in any suitable manner is a discharge conduit, the one indicated in Fig. 3 being the conduit 12 which conveys discharging fluid to the engine compartment on the right of the pilot.

For the purpose of creating pressure in the cap 60 to operate the puncturing element the electrically controlled firing device disclosed in the patent to Allen et al., 1,933,694, November 7, 1933, may be employed and for a more detailed description thereof reference may be made to said patent. This device includes a core 65 of insulation material through which extends a pair of conductors 66 and 67 connected by a resistance element 68 surrounded by inflammable material such as a powder charge 69 which is normally contained within a cup 70 held against the core 65. The core may be mounted in a member 71 which is threaded in an opening in the cap 60 and the core may be held in position by means of a threaded tubular member 72. The conductors 66 and 67 are supplied by current when the switch is closed through wires connected to battery and to the stationary contacts of the switch. When the switch in Fig. 1 is moved to engage the contact at the right of the pilot a circuit will be made through the wires 75 and 76 to fire the charge to cut the disc 34 which provides a passage for the fluid to the discharge tubing in the right hand engine compartment. When the switch is moved to engage the contact on the left hand side of the pilot a circuit will be made through

the wires 77 and 76 to perforate the disc 42 which controls the discharge of fluid into the left hand engine compartment.

While I have described my invention with reference to a preferred embodiment shown in detail, it is to be understood that I reserve the right to all such modifications and changes as fall within the principle of the invention disclosed and the scope of the appended claim.

I claim:

In a fire extinguishing system for extinguishing fire at spaced points, the combination of a container, a fitting mounted on said container and provided with a plurality of discharge ports, a sealing disc in each discharge port, a discharge head connected to each of said ports and provided with a puncturing element for puncturing the respective disc, and conduits leading from said discharge heads to said points, said discharge heads also including powder charges for operating said puncturing elements, separate circuits for firing said charges and switch means for closing said circuits, said switch means including a pivoted switch lever located intermediate of said points and operable in the direction of said points to close the circuits respectively for setting off the charges in the discharge heads connected by said conduits to said points.

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The following references are of record in the file of this patent:

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