Jan. 9, 1951 D. MAPES 2,537,074

FIRE EXTINGUISHING SYSTEM

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Fig. 1.

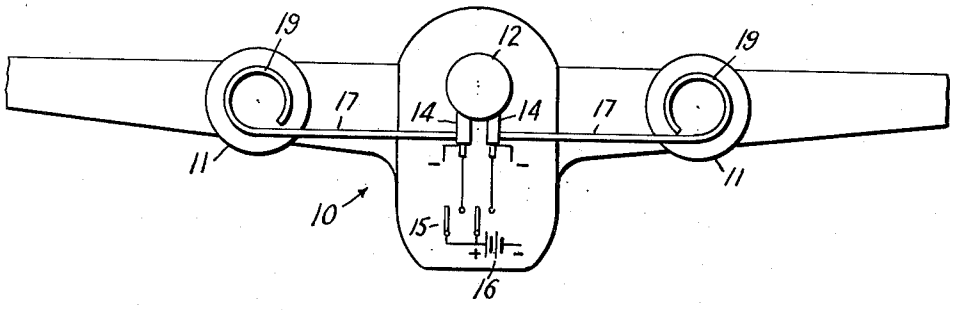
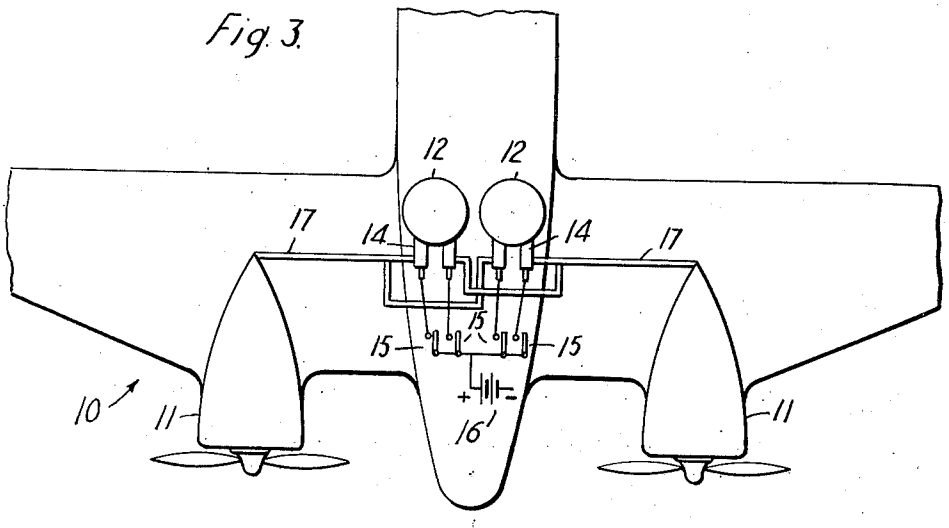


Fig. 3.



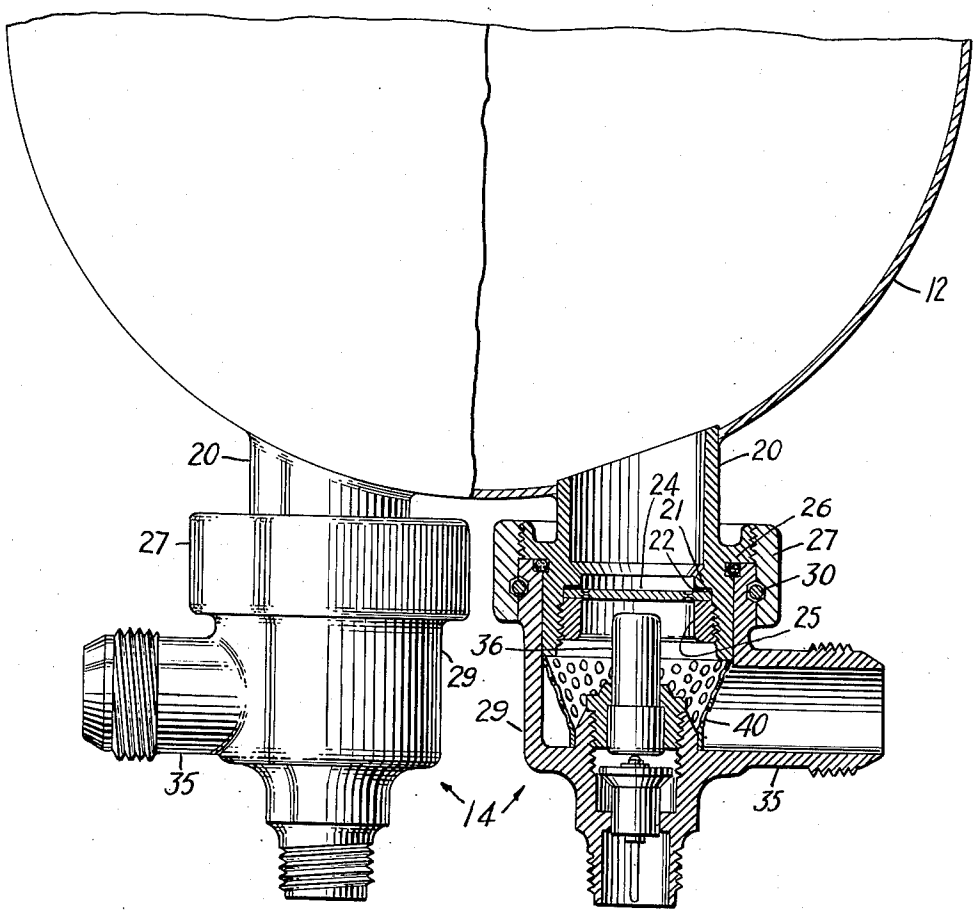
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Fig. 2.



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FIRE EXTINGUISHING SYSTEM

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1 Claim. (Cl. 169—2)

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The present invention relates to fire extinguishing systems, and particularly to such systems for selectively directing a fluid pressure fire extinguishing medium to one or more desired locations.

The present invention aims to provide a simple compact system of the foregoing type which is particularly adapted for use on airplanes or other craft or vehicles where fire hazards exist.

Accordingly, an object of the present invention is to provide an improved system of the foregoing character which is readily installed.

Another object is to provide a system wherein the necessity for direction valves and complicated controls is eliminated.

Another object is to provide a system wherein the fire extinguishing medium storage means and discharge control means therefor are combined in a compact unit adapted to be actuated locally or remotely with a minimum of auxiliary devices.

A further object consists in the combination and arrangement of elements of the system, whereby the foregoing objects and advantages are accomplished.

Other and further objects, not specifically enumerated above, will be apparent when described in greater detail in connection with the accompanying drawings, wherein:

Figure 1 is a schematic view of a portion of an airplane, viewed in front elevation, having a fire extinguishing system in accordance with the invention installed therein.

Figure 2 is a fragmentary view, partly in section and partly in elevation, illustrating the fire extinguishing medium storage unit and the discharge controls therefor.

Figure 3 is a schematic view of a portion of an airplane, viewed in top plan, having a modified fire extinguishing system installed therein.

Referring to the drawings in detail, and more particularly to Figure 1, there is shown, by way of example, an airplane 10 of the two engine type to illustrate an application of the invention wherein a plurality of fire hazards exist. Each engine nacelle 11 constitutes such a fire hazard and is protected by suitable fire extinguishing medium distributing means for applying the medium to the seat of the fire and/or establishing an inert atmosphere in the nacelle, thus serving to smother the fire.

The system comprises a fire extinguishing medium storage vessel 12 (Figure 2), located in the fuselage or elsewhere, which has a plurality of outlets; a normally closed discharge control head

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14 for each outlet, adapted to be opened selectively by means, about to be described, under the control of a switch 15 in an electrical circuit, including a battery 16 or the like; and a conduit 17 connected to the outlet of each head 14, each respectively directing fire extinguishing medium to one nacelle for distribution by a ring 19 or the like.

The storage vessel 12 and its discharge heads 14 are illustrated in detail in Figure 2, with one of the heads shown in section and the other in elevation. Only one of these heads will be described in detail, since the heads are substantially identical in construction.

The head 14, shown in section, has a nipple or spud 20 secured in one of the outlets of the container by welding. The nipple comprises an inwardly extending flange 21 providing a shoulder 22 for a shatterable closure disc 24 secured on the shoulder by a screw ring 25, and an outwardly extending flange 26 for the reception of a screw ring 27 carrying a bonnet 29 extending over the outlet end of the nipple. The screw ring 27 and bonnet 29 are connected by a ring 30 locked in complementary recesses formed in the screw ring and bonnet for permitting circumferential adjustment of the bonnet with respect to the outlet.

The bonnet 29 has a laterally extending outlet section 35 adapted for connection to the conduit 17 leading to the nacelle. By reason of the adjustability of the bonnet the outlet section may extend in any desired direction. For example, as shown herein, the outlet sections of the bonnets extend in opposite directions and towards their respective nacelles, thereby simplifying the discharge conduit connections.

The bonnet further is provided with means for shattering the closure disc 24 to establish fluid flow communication between the vessel and the conduit 17. These means comprise an electrically fired cartridge 36 for directing a slug against the disc to shatter the same. One terminal of the cartridge is grounded through the bonnet and the other terminal of the cartridge is electrically connected to one terminal of the battery 16, as shown in Figure 1. The other terminal of the battery is grounded, where upon closing of the switch 15, an electrical circuit is completed through the cartridge to actuate the same.

In order to prevent portions of the shattered disc from entering the discharge conduit, a sieve-like receptacle 40 is positioned in the bonnet between closure disc and the outlet section.

In operation, if a fire should occur in one of

the nacelles, the respective switch 15 is closed to complete the electrical circuit and cause firing of the cartridge. The cartridge effects shattering of the closure disc 24, whereby fire extinguishing medium flows from the vessel, through the bonnet and the discharge conduit to the nacelle to be distributed by the ring 18.

In Figure 3, a system is shown which is essentially the same as the system shown in Figure 1, except that two vessels each having two outlets are provided. Both vessels have one of their outlets connected to the discharge conduit leading to the other of the nacelles. Four switches 15 are provided for selectively controlling the discharge of medium through any one of the outlets.

In this manner, the system illustrated in Figure 3 may be operated to direct the discharge of one vessel to one of the nacelles, leaving the other vessel in reserve for further use in connection with either of the nacelles. Also, if fires should occur simultaneously in both nacelles, one vessel may have its contents directed to one of the nacelles while the other vesel may have its contents directed to the other nacelle.

The systems illustrated and described herein are adapted to be utilized for distributing fire extinguishing media such as carbon dioxide, methyl bromide, chloro-bromo-derivatives of hydrocarbons, or halo-derivatives of hydrocarbon compounds containing fluorine, which may be stored in the vessel under their own vapor pressure or with the addition of a gas having a substantial pressure at low temperatures such as encountered at high altitudes.

From the foregoing description, it will be seen that the present invention provides an improved fire extinguishing system which is simple in design, is economical to manufacture and is readily installed. The system comprises a minimum of fluid flow connections, conduits, valves; and the like and operation of the system can be effected by simple electrical circuit. The storage vessels and selective discharge heads are combined in a single unit thus facilitating rapid installation and making it possible to replace an entire unit in the field with maximum ease and without skilled labor. The system is rugged in construction and can withstand any rough usage to which it may be subjected.

As various changes may be made in the form, construction and arrangements of the parts herein, without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in any limiting sense.

I claim:

In a fire extinguishing system, a spherical fire extinguishing medium storage container having a pair of independent adjacent downwardly facing discharge openings, a pair of outlet spuds each secured in an opening and extending downwardly in parallel relation to each other, said spuds having an outwardly extending flange formed with screw threads on the outer peripheral wall thereof and positioned between the ends of said spuds to provide a downwardly facing shoulder, a shatterable sealing disc positioned in each of said spuds, a discharge head for each of said spuds including a one-piece body member formed with an annular inlet section telescoped over the portion of said spud below said shoulder and abutting said shoulder and said body member being formed with a laterally extending outlet section, coupling means including a screw ring threaded on said flange and telescoped over said annular section and including an annular member positioned between cooperating annular grooves formed in said annular section and said screw ring for adjustably connecting said body members to said spuds with said outlet sections facing in any desired direction to facilitate connection of discharge conduits thereto, and a chamber member in each of said heads for cartridges adapted to shatter said discs to effect discharge of fire extinguishing medium from said container.

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