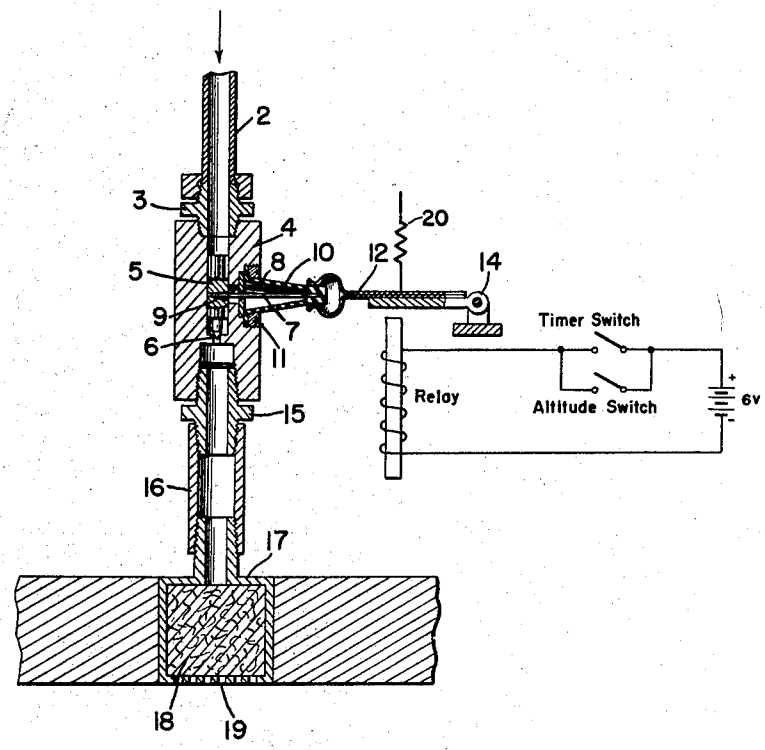
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FUEL JETTISON VALVE

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FUEL JETTISON VALVE

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3 Claims. (Cl. 23—288)

This invention relates to a valve system for jettisoning fuels from balloon, rocket or other carriers where the descent of the carrier with unspent fuel would be hazardous. Specifically, the invention relates to a valve for dumping hydrogen peroxide from a carrier after a given lapse of time, or after ascent to a predetermined altitude.

In utilizing fuels such as hydrogen peroxide in an automatic airborne vehicle, a considerable problem arises with respect to excess or unspent hydrogen peroxide especially when it is desired to dispose thereof at high altitudes or in cold weather.

It will be noted that 90% peroxide freezes at −11° C., and water, which is one of the decomposition products, freezes at 0° C. It will accordingly be evident that it is highly undesirable because of freezing characteristics alone to jettison either the concentrated or wholly decomposed peroxide. A 50% concentration of hydrogen peroxide on the other hand has a freezing point of about −52° C. This concentration has the additional advantage of being below the point at which fires might occur therefrom.

This invention is directed to a valve and catalyst arrangement which is calculated to jettison hydrogen peroxide to decompose the same to about 50% concentration and to utilize the released heat to keep the vent ice free.

In the drawing, **2** is the inlet pipe from the fuel tank. This pipe enters body **4** of the valve through coupling **3**. The valve casing **4** contains a centered needle valve **5** which seats in and closes orifice **6**. Needle valve **5** is operated through toggle lever **7** which projects through a slot in plate **8**, which plate serves as a fulcrum for the lever. The inner end of toggle lever **7** rests in a slot **9** in the needle valve body and is opened and closed by movement of the outer end of lever **7**. Polyethylene sheath **10** encloses lever **7** and is itself sealed to the valve casing by means of compression nut **11**.

Clip **12** is pivoted at **14** and envelops the end of the sheath and lever and serves to actuate the same through the relay shown. A spring **20** attached to lever **12** serves to bias the needle valve to the closed position to prevent leakage. After passing the valve aperture, the peroxide passes through coupling **15**, plastic tubing **16** and into catalyst chamber **17**. For purposes of this invention, the chamber is filled with a catalyst comprising fine aluminum turnings **18**. Screen orifices **19** pass the peroxide and decomposition products to the atmosphere.

In operation, the relay is actuated by a time switch or minimum altitude switch which lifts needle valve **5** thereby permitting the unspent peroxide to pass on into the catalyst chamber. Here the large contact surface plus the catalytic activity of the aluminum turnings quickly decomposes the peroxide to about 50%. The heat liberated by this decomposition serves to keep the orifices **19** free from ice despite the low temperature which may prevail. Simultaneously the products of decomposition are exhausted in a fine spray and are at a concentration sufficiently low to prevent fires when reaching the ground.

I claim:

1. A hydrogen peroxide jettison valve for application to airborne objects comprisiny a valve body, a valve seat in said valve body, a lever operated needle valve positioned in cooperation with said valve seat, said lever protruding through a fulcrum in the side of said valve body, flexible sealing means positioned over said lever thereby sealing valve interior from the atmosphere, a pivoted toggle arm positioned to grip the end of said lever, time and altitude sensitive means in parallel for actuating said toggle arm through a relay circuit, said means becoming operative after a given lapse of time and after descent to a preset minimum altitude, a catalyst chamber positioned in series with and below said valve so that the jettisoned hydrogen peroxide passes through said chamber before reaching the atmosphere.

2. A valve in accordance with claim 1 wherein the flexible sealing means includes a polyethylene jacket covering said lever.

3. A valve in accordance with claim 1 wherein the catalyst chamber is filled with finely divided aluminum.

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