May 30, 1939. C. SPAETH 2,160,684

FLAME ARRESTER

Filed May 28, 1937 2 Sheets-Sheet 1

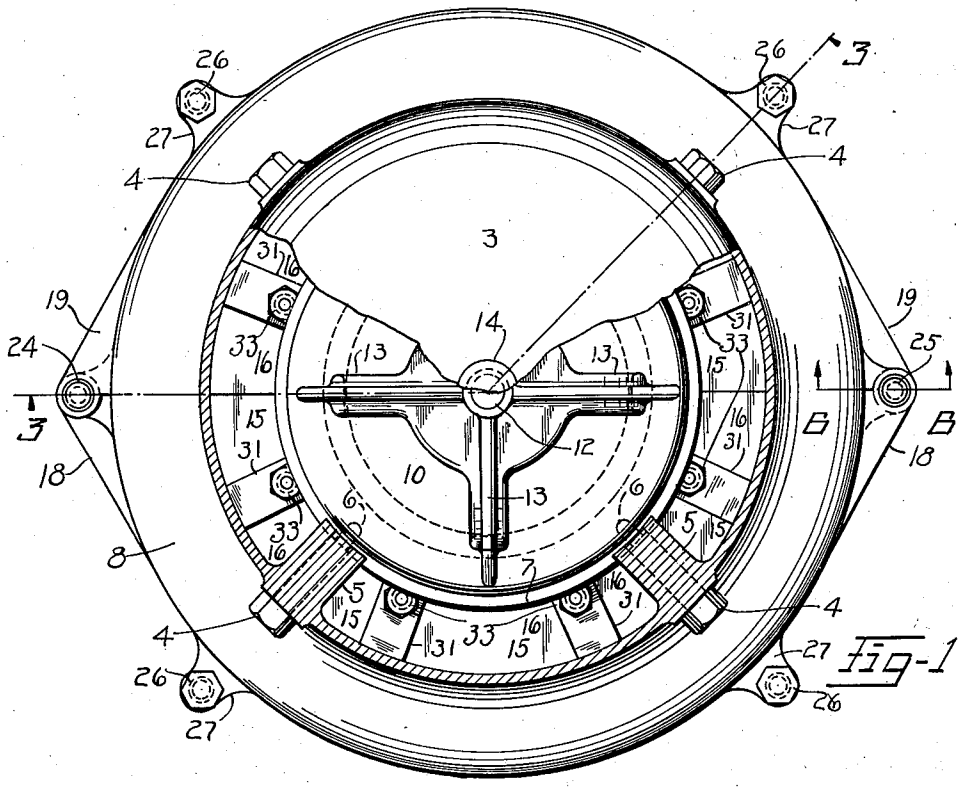


Fig-1

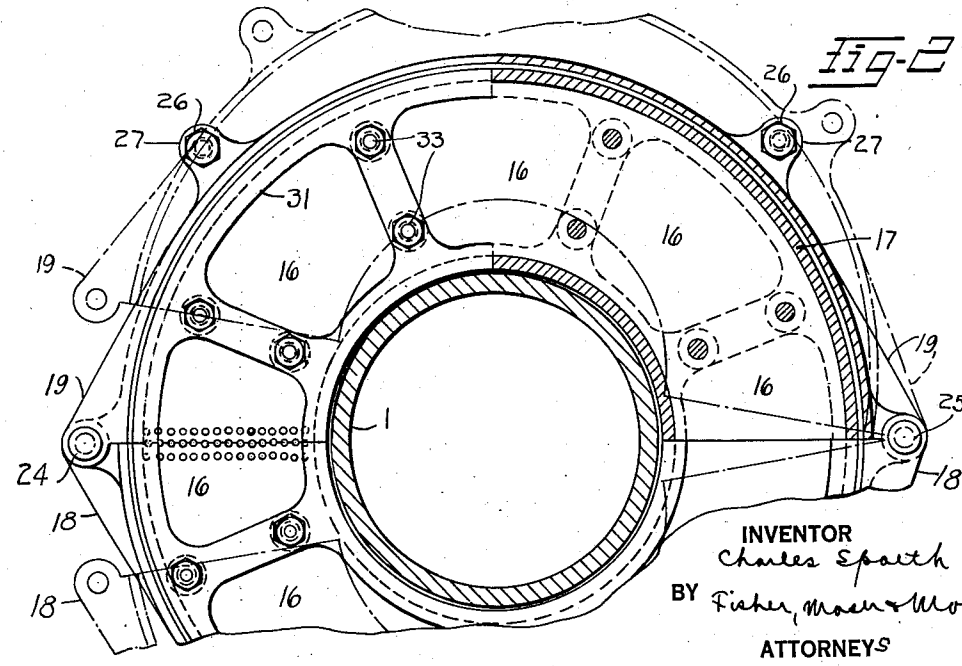


Fig-2

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FLAME ARRESTER

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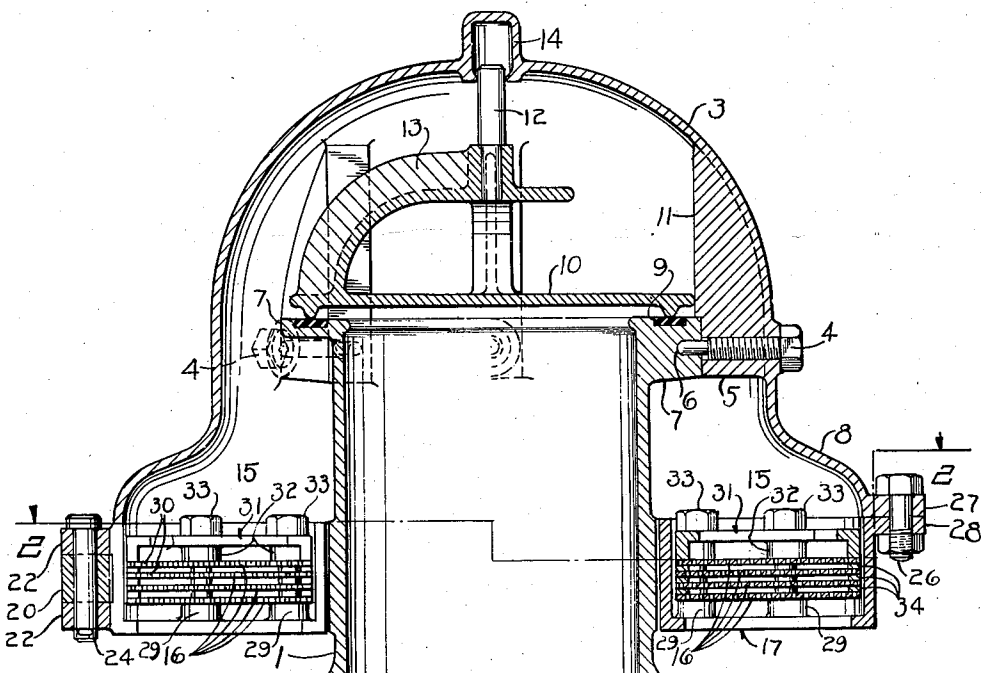


Fig-3

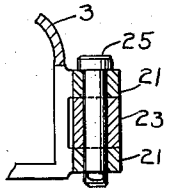


Fig-6

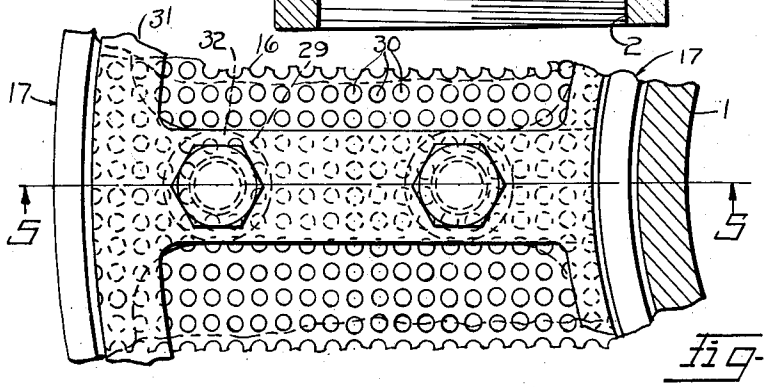


Fig-4

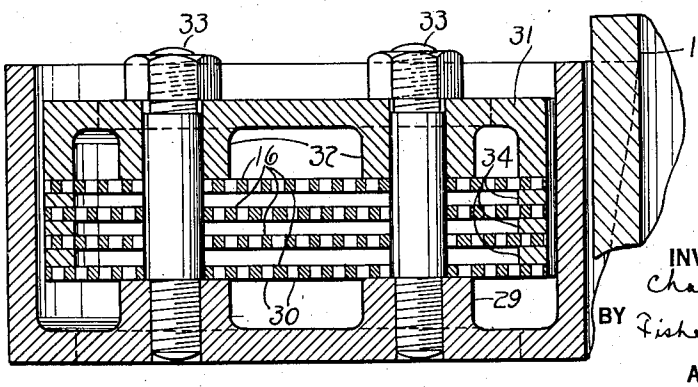


Fig-5

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Patented May 30, 1939

2,160,684

UNITED STATES PATENT OFFICE

2,160,684

FLAME ARRESTER

Charles Spaeth, Cleveland, Ohio

Application May 28, 1937, Serial No. 145,359

2 Claims. (Cl. 220—88)

My invention relates to flame arresters of that general type adapted for use on tanks in which inflammable materials such as oil and gasoline are stored.

It has long been the custom to provide the larger sizes of oil storage tanks with emergency valves, in order to permit the escape of vapors to the atmosphere and thus relieve excess pressures which may develop in such receptacles. This escape of inflammable vapors proved hazardous particularly in the event of a fire in the vicinity of the tanks, due to the possibility of the flame being communicated to the contents of the tank, through the vent opening in the emergency valve.

According to the present invention a novel form of relief valve having associated therewith means for preventing flame from reaching the contents of the storage receptacle is provided.

One of the principal objects of the present invention is to provide a combined flame arrester and valve of such construction as to permit of ready assembly and disassembly for installation and cleaning purposes respectively.

A further object of the invention is to provide an economical design in which a maximum discharge area is provided and in which the flame arrester parts are conveniently supported and housed.

Other objects and advantages of the invention will be apparent from a consideration of this specification in connection with the accompanying drawings, in which:

Figure 1 is a plan view partly in section and partly broken away showing the construction of the valve and valve hood;

Figure 2 is a staggered section on the line 2—2 of Figure 3;

Figure 3 is a section on the line 3—3 of Figure 1;

Figure 4 is a fragmentary view partly in section of the perforated plates and clamping ring;

Figure 5 is a section on the line 5—5 of Figure 4; and

Figure 6 is a section taken on the line 6—6 of Figure 1.

Referring more particularly to the drawings the numeral 1 denotes a tubular valve body internally threaded as at 2, for screw connection with the breather pipe of a storage receptacle, neither of which are shown.

A dome shaped hood 3 encloses the top of the tubular valve body 1 and is connected to the former by means of bolts 4, which pass through threaded spacing lugs 5, integral with the hood and engage in openings 6, in an enlargement or ring 7 formed on the upper end of the valve body. The hood 3 is provided with an outwardly curved depending annular apron 8 for a purpose presently described.

The ring or enlargement 7 of the valve body is provided with an annular seat 9 for a disk shaped valve 10, which is adapted to be lifted from its seat whenever excess pressure is generated in the storage tank. Guide ribs 11 formed on the inner face of the hood 3, are engaged by the periphery of the valve 10, during the movements of the latter. The valve is additionally centered and guided by means of a piston like plunger 12 projecting upwardly from a spider 13 and adapted to reciprocate in a hollow cylindrical guide 14, formed centrally of the hood 3, it being essential that the valve movement be accurate and smooth. When the valve is moved from its seat by excess pressure in the storage receptacle, vapor will escape through the annular space or chamber 15 surrounding the top of the valve body and thence to the atmosphere.

To guard against flame being communicated to the contents of the tank through the medium of the escaping vapor I provide a flame arrested device composed of a plurality of perforated bronze plates 16, adjacent the exit end of the annular vapor space or vent 15. These plates are supported in superposed relationship within an annular holder 17, comprising two similar semi-circular hinged portions 18 and 19. The part 18 is formed with a single hinge lug 20, at one side and two spaced hinge lugs 21 at the other side thereof, while the part 19 has two corresponding spaced lugs 22, at one side between which the lug 20 is received and at its other side the part 19 has a single lug 23 adapted to be received between the spaced lugs 21. All these lugs are apertured for the reception of the respective clevis or hinge pins 24 and 25. When the cotter pins are in place the holder 17 is clamped tightly about the valve body 1. Bolts 26 passing through apertured lugs 27 and 28, respectively formed on the apron 8 and the upper outer edge of the holder 17, secure the holder to the dome 3.

The bottom of holder 17 is of spider like formation and projecting upwardly therefrom are apertured lugs 29, upon which the stack of plates rest, apertures 30 in one plate being preferably staggered with respect to the apertures 30 in the next adjacent plate. An annular clamping ring 31, also of spider like construction and formed with apertured lugs 32, seats upon the topmost plate 16. Studs 33 extend through the lugs 32 and 29 and clamp the plates tightly in the holder.

Intermediate spacing rings 34 separate adjacent plates from each other.

From the foregoing it will be apparent that the plates can be easily installed and as easily removed for cleaning. It will also be noted that the plates being coextensive with the outlet end of the entire annular space 15, excess pressure will instantly be relieved without danger of back pressure from trapped vapor.

What I claim is:

1. The combination with a tubular valve body having its lower end communicating with a storage tank for volatile liquids, a hood positioned over the top end of said valve body and spaced therefrom to provide an annular chamber communicating with the atmosphere, a plate holder communicating with said annular chamber and comprising two semicircular members, means for hinging said members together, means for securing said members to the valve body, and a plurality of perforated plates removably supported in said holder.

2. The combination with a tubular valve body having one end communicating with a storage tank for volatile liquids, a hood positioned over the other end of said valve body and spaced therefrom to provide an annular chamber, a two part hinged annular plate holder open at its ends, means for clamping said plate holder about said valve body in communication with said annular chamber and the atmosphere, a plurality of spaced perforated plates removably supported in said holder and means for securing said holder to said hood.

CHARLES SPAETH.