

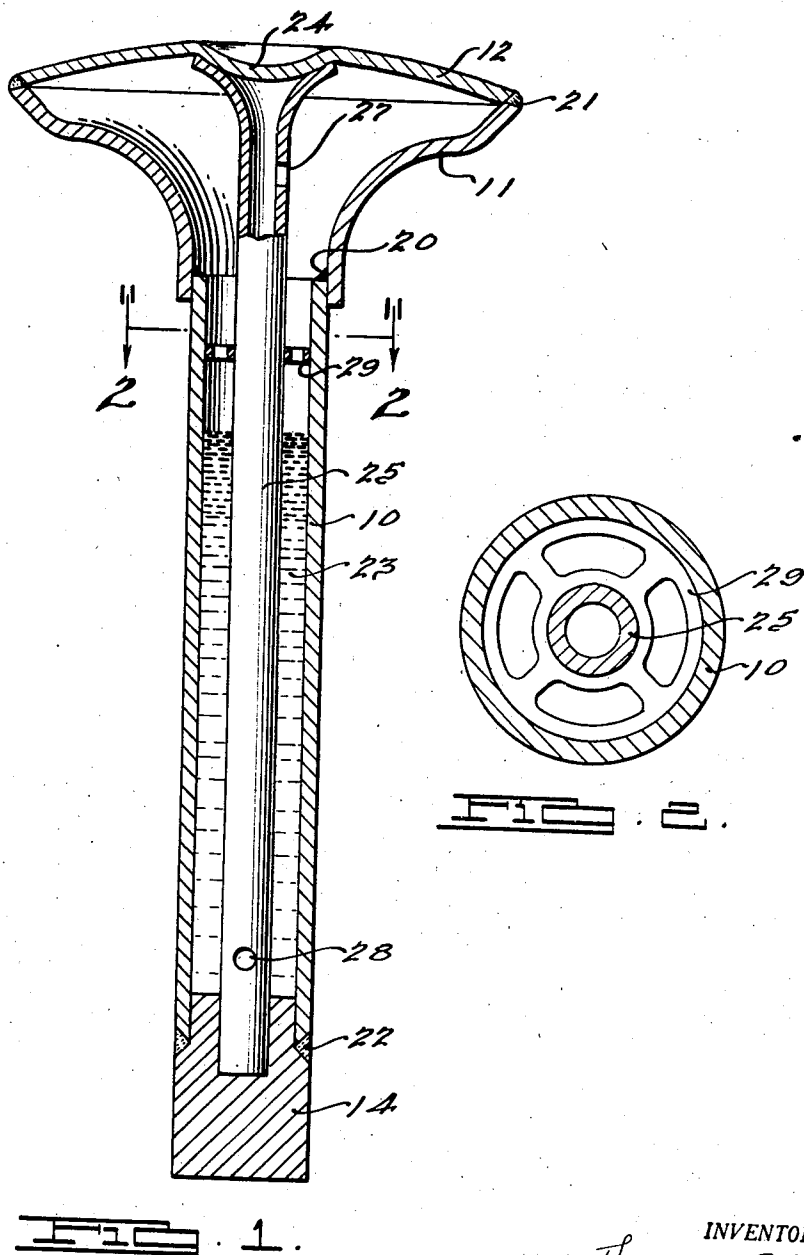
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VALVE

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2,371,548

VALVE

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Application December 6, 1943, Serial No. 513,053

4 Claims. (Cl. 123-177)

This application relates to hollow coolant filled valves, such as are described in a prior application of mine, for Valve, Serial No. 513,052, filed December 6, 1943.

I have observed that in such valves a vapor lock arises by virtue of the accumulation of vapor pressure in the head of the valve which interferes with free flow of the coolant to the head and the dome of the valve.

In this application I disclose a communicating by pass or relief tube within the valve for relieving vapor pressure in the head so that movement of the coolant to the head and to the dome is facilitated. The hollow tube formed for this purpose may have its upper ends outwardly flared so that coolant is directed to the outer edges of the valve head, where its presence is most urgently needed. The tube may be secured at its ends respectively to the dome and to the foot of the valve so as to provide a rigidifying strut extending between and connecting the dome and the foot of the valve, and may also be connected to the stem sides to form a strut against lateral forces.

A valve as made in accordance with the foregoing is disclosed in the appended drawing.

In this drawing,

Fig. 1 is an elevation section of a valve.

Fig. 2 is a transverse cross section on line 2-2 of Fig. 1.

The valve herein disclosed comprises initially separate stem, head, dome and foot portions 10, 11, 12 and 14 respectively, integrally joined by welds at 20, 21, and 22.

The stem 10 is of tubing, and the head 11 and the dome 12 are stamped of thin sheet stock.

The valve is filled with coolant, shown at 23, which may be metallic sodium, liquefying under heat, as when the valve is used as an exhaust valve in an internal combustion engine.

In this type of valve, and under the circumstances of use, there exists a tendency for vapors to form and accumulate a vapor pressure within the head. To relieve such vapor pressure, which interferes with free flow of the coolant to the dome, and to facilitate such free flow of the coolant to the dome, I provide a hollow tube 25 having a head end opening 27 and a foot end opening 28. This tube will function to relieve any vapor pressure built up within the head 11 and will thus facilitate free flow of the coolant to the dome where it is needed most urgently.

The tube may have its upper end flared to direct the coolant to the outer edges of the valve where its presence is most urgently needed.

The tube 25 has its upper and lower ends secured respectively, in any suitable manner to the dome 12 and the foot 14, whereby it forms a rigidifying and connecting strut between these portions, in the direction of the forces which move the tube up and down in the valve seat in the engine. Any suitable method or means for securing the ends of the tube to the dome and foot portion may be utilized and the means shown are but representative.

Disposed in the annular space between the tube and the stem, and by the same token adapted to be disposed in the annular space between the tube and the head or the dome, are one or more spiders 29, (one only is shown) perforated to permit the coolant to circulate freely in the valve, but operating to brace the tube internally against transverse deflection.

When the valve is in operation, the coolant from time to time moves to the dome of the valve. There is no vapor pressure in the head to interfere with this free circulation of the coolant.

Now having described the valve herein disclosed, reference should be had to the claims which follow.

I claim:

1. A hollow completely sealed coolant filled valve of the class described having means therein for providing a communicating by pass or relief means between the interior of the head, through the coolant, to the lower portion of the stem, remote from the head, for relieving vapor pressure in the head, and thus facilitating movement of the coolant into the head and to the dome, the means comprising a hollow tube extending through the coolant and having openings near the head and near the foot of the valve, with the coolant being outside the tube.

2. A hollow completely sealed coolant filled valve of the class described having means therein for providing a communicating by pass or relief means between the interior of the head, through the coolant, to the lower portion of the stem, remote from the head, for relieving vapor pressure in the head, and thus facilitating movement of the coolant into the head and to the dome, the means comprising a hollow tube extending through the coolant and having openings near the head and near the foot of the valve, with the coolant being outside the tube, the head end of the tube being outwardly flared.

3. A hollow completely sealed coolant filled valve of the class described having means therein for providing a communicating by pass or relief means between the interior of the head, through

the coolant, to the lower portion of the stem, remote from the head, for relieving vapor pressure in the head, and thus facilitating movement of the coolant into the head and to the dome, the means comprising a hollow tube extending through the coolant and having openings near the head and near the foot of the valve, with the coolant being outside the tube, the ends of the tube being secured, respectively, to the dome and the foot of the valve to provide a strut connecting them.

4. A hollow completely sealed coolant filled valve of the class described having means therein for providing a communicating by pass or relief

means between the interior of the head, through the coolant, to the lower portion of the stem, remote from the head, for relieving vapor pressure in the head, and thus facilitating movement of the coolant into the head and to the dome, the means comprising a hollow tube extending through the coolant and having openings near the head and near the foot of the valve, with the coolant being outside the tube, and laterally extending means connecting the tube and the inside of the valve stem to form lateral reinforcements.

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