

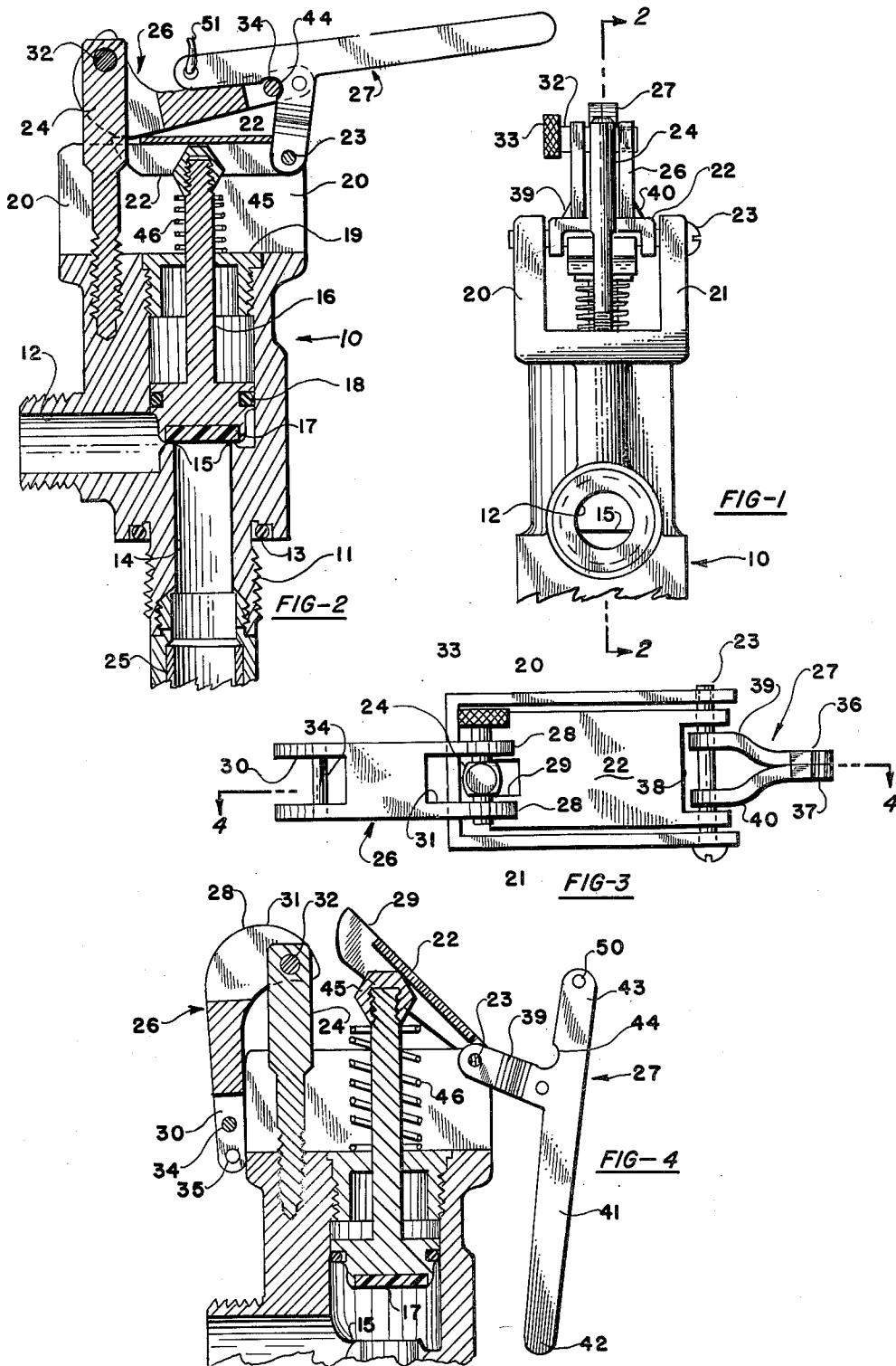
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FALLING WEIGHT OPERATED VALVE

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## FALLING WEIGHT OPERATED VALVE

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2 Claims. (Cl. 251-74)

This invention relates to a valve for dispensing dry powder fire extinguishing chemicals operated by a falling weight actuated by the heat of the fire.

It is an object of this invention to provide a valve actuated by a falling weight.

It is another object to provide a valve adapted to retain high gas pressure, said gas pressure unseating said valve upon actuation by said weight.

These and other objects of this invention will become apparent upon reading the following descriptive disclosure taken in conjunction with the accompanying drawing showing an illustrative embodiment of the invention and in which;

FIG. 1 is a front elevation view of the valve, showing it in the closed position,

FIG. 2 is a view taken on line 2-2 of FIG. 1,

FIG. 3 is a top plan view of the valve, and

FIG. 4 is a view taken on line 4-4 of FIG. 3 and showing the valve elements in the open position for dispensing dry powder fire extinguishing chemicals.

Turning to the drawing, a conventional metal valve housing 10 is provided with a screw threaded nipple 11 for threading into a pressure resistant tank (not shown) and with an outlet orifice 12. An air tight seal with the replaceable tank is made by means of O-rings 13 made of suitable plastic material.

As shown in FIG. 1, the passageway 14 is provided with a circular valve seat 15. A conventional plunger 16 is provided with a suitable plastic disc 17 inserted in the bottom thereof. An O-ring 18 of suitable plastic material is disposed in a suitable annular groove located in the bottom of the plunger 16. An apertured screw threaded cap 19 is disposed in the interiorly threaded top end of passageway 14. The stem of the plunger 16 passes through the aperture of the cap 19 and extends suitably therebeyond.

The valve housing 10 is provided at its top with a pair of integral spaced-apart parallel walls 20 and 21 disposed in line with the axis of the outlet orifice 12. A flanged swingable plate 22 is pivoted at one end by a pin 23.

As shown in the drawing and particularly in FIG. 2 a pillar 24 is provided with screw threads at one end and is threaded into a screw threaded cavity disposed in the housing between walls 20 and 21 and over the outlet orifice 12. The top end of pillar 24 is provided with an aperture disposed transversely to the axis of the orifice 12.

An important feature of this invention is the co-action of a pair of locking levers, which normally hold plate 22 in down or valve closed position. The locking engagement of this pair of levers is released by a falling weight actuating one of them, thereby permitting the high pressure of the gas used for expelling the dry powder to move up the syphon tube 25 and into the valve passageway 14 forcing the plunger 16 with its plastic disc 17 from the circular valve seat 15 permitting the dry powder fire extinguishing chemicals to be expelled through the outlet orifice 12.

To effect the above result, the pillar 24 is provided with a unique cam locking lever 26 and a unique trip lever 27 is made to co-act with said cam lever 26.

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The cam lever 26 is provided with a pair of curved cam surfaces 28 adapted to engage the plate 22. Plate 22 is provided with an end channel 29 to receive pillar 24.

The cam lever 26 is provided with a front U-shaped channel 30 and a rear U-shaped channel 31. The sides forming the rear channel 31 are provided with linearly disposed apertures and the lever 26 is hinged to the pillar 24 by means of a hinge pin 32. The hinge pin 32 may be provided with a knurled knob 33 for finger manipulation, as for example where the end opposite to knob 33 provided with screw threads and threaded into a side of the cam lever 26.

The front end of the cam lever 26 is provided with a suitably disposed holding bar 34 for effecting a locking engagement with the trip lever 27. The sides forming the front channel 30 are provided with respective apertures 35 in order to provide means for receiving a safety pin (not shown) whenever the apparatus is transported from place to place.

The trip lever 27 is preferably made of a pair of stamped-out elements 36 and 37 welded together to form a fixed unit. However, lever 27 may be of integral construction machined by conventional practice to assume the configuration shown of lever 27. The back of plate 22 is provided with a suitable cut-out portion 38 to receive the legs 39 and 40 of the elements 36 and 37. The pivot pin 23 is passed through suitable apertures disposed in the opposed flanges of flange plate 22 and suitable aperture disposed in the legs 39 and 40 of the trip lever 27. Pivot pin 23 may be provided with screw threads or other conventional means for removably securing it to the housing walls 20 and 21. The trip lever 27 is provided with a long arm 41, which the falling weight engages adjacent its free end 42, and also with an integral short arm 43 having a critically shaped curved locking recess 44 adjacent to the top of the integral legs 39 and 40.

In operation the locking bar 34 of lever 26 is pushed into the locking recess 44 of the trip lever 27 when the arm 41 is rotated counterclockwise (FIG. 1) about pin 23 as far as it will go.

The plunger 16 is provided at its top end with screw threads for receiving a beveled slide block 45 having a suitable threaded cavity therein.

A suitable coil spring 46 is inserted over the plunger end and rests on the top of cap 19 and against block 45 normally continually urging it upward against the flanged plate 22.

Turning now to FIG. 4, in order to lock the tank after supplying it with dry powder, the plate 22 is pushed down by cam surfaces 28 until the plastic disc 17 engages the valve seat 15. Then the trip lever 27 is rotated locking bar 34 in the recessed cavity 44 and effecting a firm seating disc 17.

Then the tank containing the dry chemicals may be charged with high pressure gas by means of a separate valve such as are used on automobile tires. The valves thus is made to assume the locked or closed position shown in FIG. 2.

To operate the valve, the outlet nozzle 12 of which may be disposed above the surface of a combustible liquid, the end 42 of the lever 27 is hit by a falling weight set in motion by melting a low melting plug holding the weight vertically over the lever end 42 by means of wires connected to the plug. Thus where the plug is located over the combustible liquid, the heat of combustion will melt the plug causing the weight to fall and trip the trip lever 27 thereby permitting the high gas pressure in the tank and syphon tube 25 to push the plunger 16 upward and cause the flanged plate 22 to move upward, rotatively pushing the cam lever (FIG. 4).

The short arm 43 of the trip lever may be provided with an aperture 50 and a wire 51 secured thereto so that if a fire is seen the lever 27 may be tripped by a manual upward pull on wire 51 even before sufficient heat is generated to automatically set off the falling weight.

This invention is of broad scope so that it is not to be limited to the illustrative embodiment shown.

We claim:

1. In a valve for dispensing dry powder fire extinguishing chemicals from a syphon tank containing gas under pressure, said valve having a moveable rod plunger protruding from the top flat wall of the housing through a suitable aperture therein, the improvement comprising a vertical integral housing wall disposed on each side of said protruding plunger and in suitable parallel spaced-apart relationship, said housing having an exit orifice communicating with a valve seat therein, a pillar centrally disposed in said top of the housing between said parallel walls at the front end thereof and protruding suitably above said walls, a substantially T-shaped trip lever having lateral arms and an aperture in the base of the stem suitably disposed at the rear portion of the parallel walls, a journal pin suitably disposed through the rear portions of said walls and through said aperture in said trip lever, a suitably curved cam lever hingedly secured at one end to said pillar and having a transverse holding bar at the other end, a dual flanged swing plate secured through apertures in the rear of the flanges thereof to said journal

pin, block means removeably disposed on the top end of said protruding plunger, whereby said cam lever rotated clockwise rests on said swing plate and said trip lever rotated suitably counterclockwise engages said bar of said cam lever in a locked relationship at the juncture of the stem and the inward disposed lateral arm of said trip lever, thereby permitting a falling weight force exerted on the outward disposed lateral arm to trip said T-lever permitting the gas in the tank to lift said plunger off its valve seat and rotate suitably said swing plate and said cam lever with suitable dispensing of said dry powder from said orifice.

2. The valve of claim 1 comprising a suitable recessed cavity intermediate said inwardly disposed arm and the stem of said T-shaped trip lever to captively retain said cam lever against said swing plate, and coil spring means disposed around said plunger intermediate said top housing wall and said block means for continuously urging said block means away from said housing.

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