

Oct. 11, 1938.

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2,133,200

VALVE

Filed Aug. 31, 1936

Fig. 1.

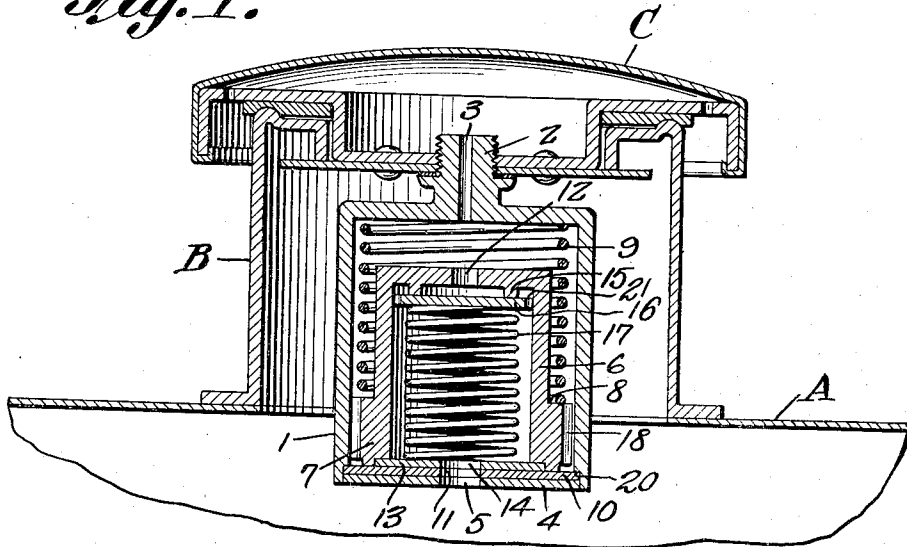
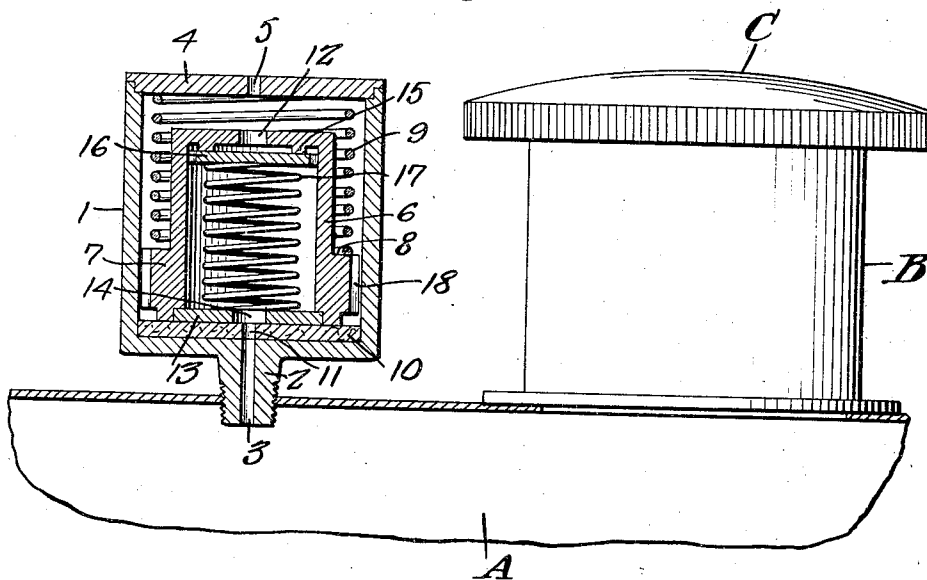


Fig. 2.



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2,133,200

VALVE

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Application August 31, 1936, Serial No. 98,794

1 Claim. (Cl. 277—45)

This invention relates to valves, and the general object is to provide a valve for use with fuel tanks of internal combustion engines, preferably of motor vehicles to prevent the free escape of fuel vapor therefrom, so that the vapor will accumulate or build up within the tank under pressure controlled by the valve, for the purpose of forcing the liquid fuel to the fuel pump or carbureter thereby over-coming vapor locking troubles in the fuel line, fuel pump failures and the like; as well as to provide and assure a material decrease in the consumption of fuel, due to the utilization of the vapors and prevention of fuel losses by evaporation and dissipation thereof to the atmosphere, and such prevention will obviously result in the fuel being maintained in the same volatile condition, as when put in the tank.

A further object of the invention is to provide a valve of the character set forth, that can be applied to the filling spout closure cap of a fuel tank, or anywhere in direct relation to the tank for disposal above the normal high level of the fuel therein.

Another object of the invention is to provide a valve to allow and control the accumulation of vapor within a fuel tank, that is simple in construction, inexpensive to manufacture, easy to install in tanks now in general use, and is extremely efficient in use, operation and service.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawing and specifically pointed out in the appended claim.

In describing my invention in detail, reference will be had to the accompanying drawing wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is a fragmentary sectional view showing my valve applied to the closure cap of the filling spout of a fuel tank, to depend therefrom within the tank.

Figure 2 is a sectional view taken through a slightly modified form of valve disposed exteriorly of the tank, and in communication therewith.

Referring to the drawing in detail the letter "A" indicates a fuel tank of an internal combustion engine for motor vehicles, "B" the filling spout thereof and "C" the closure cap for the spout.

In the use of my valve, the vent openings of the cap are either eliminated or permanently closed, except when the valve is applied to the cap as shown in Figure 1, it being understood that the

valve can be applied with respect to the tank to communicate therewith above the normal high level of the fuel therein.

The forms of the valve as shown, are practically identical and each include a hollow cylindrical body 1 which has a nipple 2 extending from one end thereof, with a bore 3 through the nipple. In the form as shown in Figure 1, the nipple is threadedly secured to the lining of the cap, while in Figure 2 the nipple is threadedly secured directly to the tank. The body is preferably of cylindrical formation and the opposite end is closed by a closure 4 having an opening 5 therein. The closure 4 engages on an internal shoulder 20 formed in the body 1, and is held thereon by crimping or the like.

Mounted for movement within the body is a hollow piston 6 which is provided with an enlarged portion 7 providing a shoulder 8 on the inner end thereof to act as an abutment for one end convolution of a coiled spring 9 which has its opposite end convolution engageable with the closed end of the body in the form as shown in Figure 1, and with the closure 4, in the form as shown in Figure 2, consequently it will be seen that the piston is urged toward one end of the body and is normally held seated accordingly against a resilient gasket 10 that has an opening 11 therein registering with the opening 5 of the form of Figure 1 and the bore 3 of the form of Figure 2.

The upper end of the piston is closed and provided with an opening 12, while its lower end is closed by a plate 13 having an opening 14 therein, and all the openings register with each other and the bore to provide a direct communication, as shown.

Depending from the closed end of the cylinder, is an annular rib 15 providing a seat for a disc plate 16 that is normally held seated through the instrumentality of a coiled spring 17, and the disc plate provides a valve for controlling the opening 12 of the piston. The disc plate 16 is provided with notches 21 in the periphery thereof to allow for the passage of air about the same when in open position.

The enlarged portion 7 of the piston 6 has grooves 18 extending vertically therein to provide by-pass channels between the piston and the cylindrical wall of the body as will be apparent.

From the above description and disclosure of the drawing, it will be obvious that the valve provided by the disc plate 16 will open at minimum pressure, due to the size of the coiled spring

18 which is relatively smaller than the coiled spring 9, thereby allowing atmospheric air to enter the tank to relieve any vacuum therein. When the vacuum is relieved, the vapor pressure will build up therein and thereby seat the disc plate for closing the opening 12, it being obvious that the vapor enters the piston through the opening 14 in the closure plate 13. When the vapor pressure has accumulated or is built up within the tank to an excess amount, it will be apparent that it will lift the piston 6 against the spring 9 and thereby allow for the escape of the vapor through the grooves 18, and the bore 3 in the form of Figure 1 and the opening 5 in the form of Figure 2.

It is thought from the foregoing description that the advantages and novel features of my invention will be readily apparent.

I desire it to be understood that I may make changes in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claim.

What I claim is:

A valve for fuel tanks comprising a cylindrical housing closed at one end and having an internal annular shoulder at the opposite open end thereof, a nipple carried by said closed end and provided with a bore communicating with the interior of the housing, a closure disk held against said internal annular shoulder provided with an axial opening, the open end of said housing being crimped against said closure to hold said closure against said shoulder, a cylindrical body provided with peripheral ribs slidably engaging the interior of said housing, said body having an end wall confronting the closed end of said housing provided with an axial opening, an annular valve seat on the inner side of said end wall about the opening therein, an apertured closure plate on the other end of said body, a flat valve engageable on said seat provided with marginal ribs slidably engaging the wall of said body, a spring between said body closure plate and said valve, a spring constantly holding said body against said closure disk, and a gasket between said closure disk and the adjacent end of said body.

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