

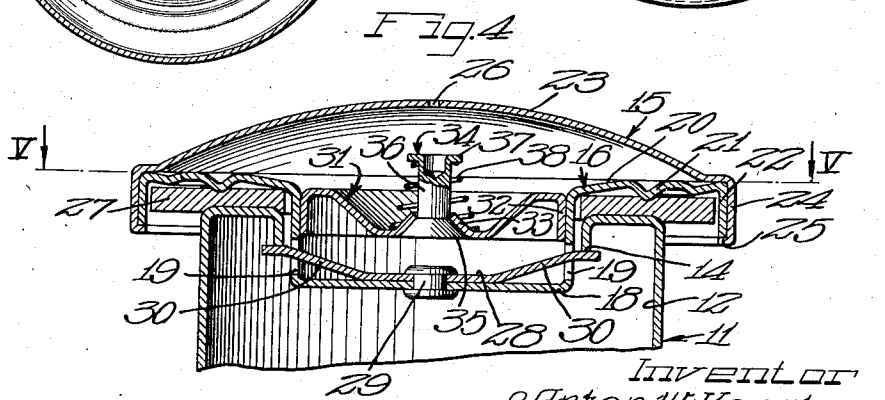
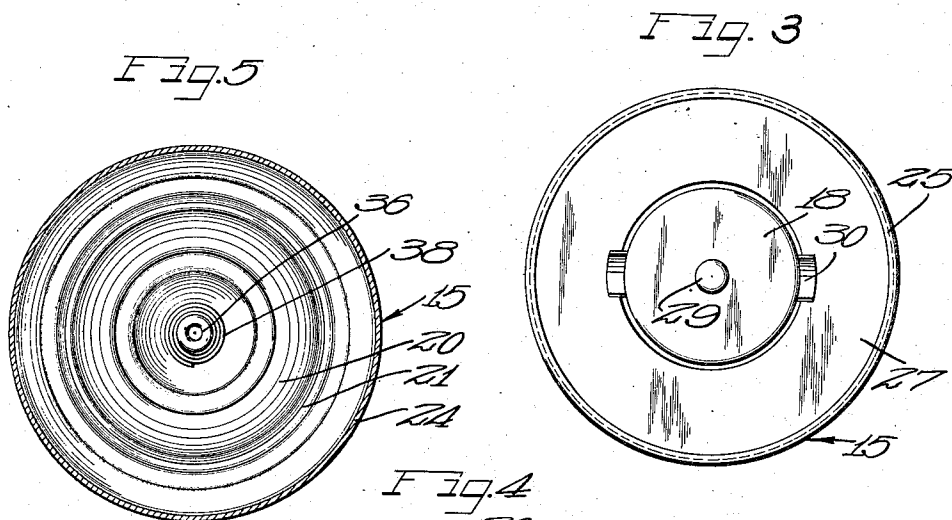
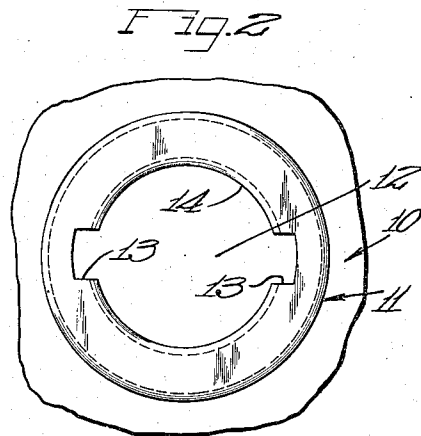
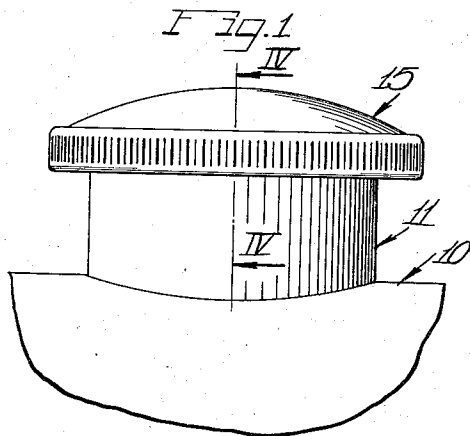
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GAS TANK CAP VALVE

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GAS TANK CAP VALVE

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1 Claim. (Cl. 137—541)

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The present invention relates to a closure cap and more particularly to a tank cap especially adapted for use as a closure for a gasoline tank opening and provided with a valve for venting the tank to the atmosphere while preventing the loss of liquid or vapor through the vent.

As is well known, it is necessary to vent tanks or other storage containers having a body of volatile liquid confined therein to prevent vapor lock interference with the withdrawal of liquid from the tank. In automobile gasoline tanks, such a vent is generally provided by means of a hole of relatively small diameter formed in the cap of the gasoline tank and communicating directly with the body of fuel contained within the tank. The possibilities of fuel loss, both in the liquid and the vapor phases, will also be appreciated by those skilled in the art.

Any object of the present invention is to provide an improved closure cap especially adapted for use with automobile gasoline tanks, the cap being provided with a vent aperture and a spring urged closure valve for preventing loss of fuel, while permitting venting of the tank to atmospheric pressure.

Another important object of the present invention is to provide a simple spring-urged valve structure for employment in a vented closure cap to prevent the loss of vapor or liquid from the tank without interfering with the venting of the tank contents to the atmosphere.

In accordance with the general features of this invention, there is provided a closure cap for a receptacle opening having opposing cam edges, the cap including a body portion insertable into the receptacle opening, and deflectable arms extending outwardly beyond the body portion for engaging the cam edges of the opening to position the body portion within the opening. A cap cover is secured to the body portion to overlie the same in spaced relation thereto, the cover being apertured to provide a vent in fluid communication with the interior of the receptacle.

A spring urged valve is interposed between the body portion and the cap portion, the valve being spring urged to closed position under a light load to permit venting of the receptacle to atmosphere through the vent hole, while at the same time preventing the flow of either liquid or vapor from the receptacle through the vent hole.

Other objects and features of this invention will more fully appear from the following detailed description taken in connection with the accompanying drawings.

On the drawings:

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Figure 1 is a side view of the neck of a receptacle or tank having a cap of the present invention secured thereto;

Figure 2 is a plan view of the receptacle neck; Figure 3 is a bottom elevational view of the cap of the present invention;

Figure 4 is a sectional view, with parts shown in elevation taken along the plane IV—IV of Figure 1; and

Figure 5 is a sectional view taken along the plane V—V of Figure 4.

As shown on the drawings:

In the Figure 1, reference numeral 10 refers generally to a receptacle or tank having a generally cylindrical neck portion 11 projecting upwardly therefrom and defining an inner opening 12 communicating with the interior of the tank (Figure 2). The neck portion is provided with conventional diametrically opposed cam or bayonet slots 13—13, opening on cam edges 14, which face the interior of the tank. This structure is conventional in the tank art and particularly in the automobile gasoline tank art.

A tank cap 15 of the present invention is adapted to be detachably secured to the neck portion 11 so as to close the opening 12.

The cap comprises generally a cupped metal stamping 16 provided with a central, depending, cylindrical cup 18 having opposed slots or vent apertures 19 formed in the side walls thereof. The stamping 16 is also provided with a radially outwardly extending flange 20 provided with an annular depressed portion 21 and a terminal depending flange 22 concentric with the cup 18.

A polished cap or lid 23, also provided with a peripheral flange 24, is secured to the stamping 16, as by an inturned terminal flange 25 underlying the flange 22 of the stamping 16. The cap 23 is provided with a central upwardly dished portion in spaced relation to the cap 18 having a central restricted orifice or vent hole 26.

A gasket or seal ring 27 is positioned to abut the flange 20 of the tank 16, the ring 27 being confined between the flange 20 and the adjacent portions of the neck 11, with the annular portion 21 in sealing engagement therewith when the cap is positioned thereon as shown in Figure 4.

The stamping 16 is secured within the neck 11 by means of a locking element 28 fastened to the mouth of the cup 18 by suitable means, as by rivets 29. The locking element 28 is provided with opposed deflectable arms 30 sized to be inserted through the slots 13—13 of Figure 2 and contacting the camming surfaces 14 upon ro-

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tation of the stamping 16 relative to the neck 11.

A dished valve plate 31 having a downturned peripheral flange 32 nested and secured within the cup 18 and an upstanding, centrally apertured, central embossment 33, is interposed between the cover 23 and the stamping 16 as best shown in Figure 4. The frusto-conical inner surface of the embossment 33 forms a valve seat for a valve 34 having a lower frusto-conical head 35 engaging the valve seat 33 and an upstanding central post 36 extending through the aperture in the embossment 33. The post 36 terminates in an out turned peripheral flange 37 which cooperates with the embossment 33 to receive a spiral compression spring 38 therebetween.

The operation of the valve 34 will be readily appreciated from the foregoing description and the drawings, in which it will be seen that the spring 38 urges the valve head 35 into seating engagement with the valve seat provided by the embossments 33. The valve, when thus seated by the spring 38, prevents the egress of fumes or liquid from the interior of the tank or receptacle 10 and the neck 11, while upon the creation of pressures within the neck 11 lower than atmospheric pressure is vented through the vent 36, the valve will be opened against the spring 38 to permit venting of the receptacle 10 to atmosphere.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

In a closure cap construction for closing the

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filling opening of a fluid receptacle, a body member comprising a stamped metal disk drawn into a generally dished configuration to provide a recess on one face of the disk and having a struck-out centrally apertured conical embossment extending into said recess and providing an annular conical valve seat on the opposite face of said disk, a venting valve having a complementary conical head seated on said seat and having a stem extending into said recess, and a coil spring in said recess having one end receiving said embossment and connected to said stem to normally load said valve closed, said valve opening against said spring for automatic venting, said stamping having a peripheral cylindrical flange extending in coaxial direction of said valve seat from said one face of the disk.

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