Aug. 31, 1926. 1,598,382

W. H. McNUTT

SAFETY CLOSURE FOR CONTAINERS

Filed Dec. 3, 1924

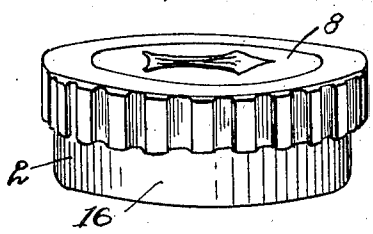


Fig. 1.

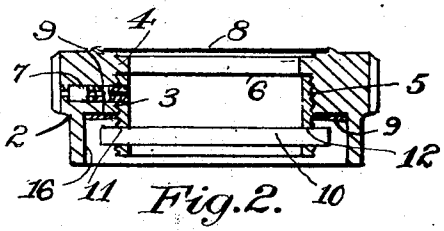


Fig. 2.

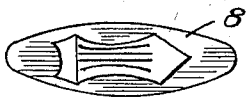


Fig. 4.



Fig. 5.

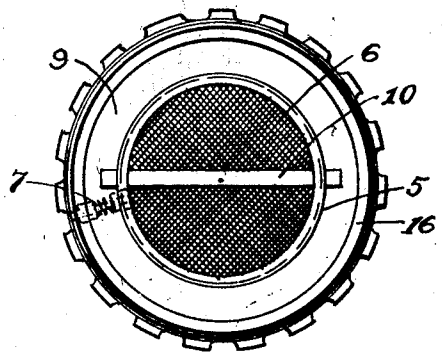


Fig. 3.



Fig. 6.

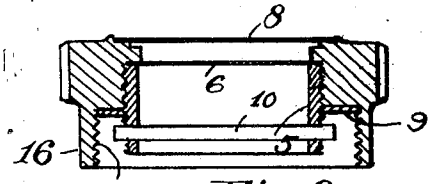


Fig. 9.

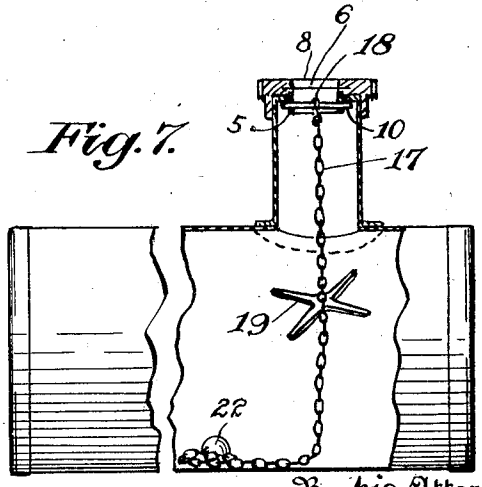


Fig. 7.

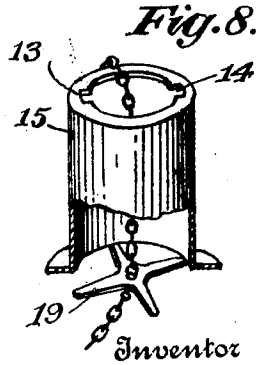


Fig. 8.

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UNITED STATES PATENT OFFICE.

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SAFETY CLOSURE FOR CONTAINERS.

Application filed December 3, 1924. Serial No. 753,540.

The present invention while designed for use with containers for inflammable and explosive fluids of various kinds, is especially designed for the containers or tanks on motor vehicles for the gasoline, in which the covers must be removed for filling the tank.

One object of the invention is to provide a closure that will readily prevent escape of vapor or gas that is generated through abnormal heat, while preventing the flame from going down into the tank, that would produce an explosion.

A further object is to provide a device of this character that can be attached and removed by a connection in the nature of a bayonet joint.

Another object of the invention is to provide in connection with said arrangements, a simple means for a permanent connection between the closure and the tank, which will limit the movement of the closure away from the tank, to prevent its being lost, or dropping on the ground or floor.

A further object is to provide a conductive connection between the closure and the tank that will form an outlet ground for any static charge on the closure that may be produced in the vicinity, such as by a gasoline pump and the like.

Another object is to provide a convenient vent aperture in the device that will normally permit an escape of undue pressure, but which can be readily closed by solder or other means when it is desired to use it as a closed container.

In the accompanying drawing showing one embodiment of my invention Figure 1 is a perspective view.

Fig. 2 is a vertical section through the closure.

Fig. 3 is a bottom plan view.

Figs. 4, 5 and 6 show interior parts separately.

Fig. 7 shows the tank with the closure in place; and

Fig. 8 shows the filler tube open.

Fig. 9 shows a modified form of closure.

The closure as shown comprises a ring frame 2 having a screw-threaded bore 3, which has an annular flange 4 projecting into the bore and forming a shoulder at its lower face. A threaded tube 5 is screwed into the bore for the purpose of securing a disk 6 of sheet metal containing very fine perforations that are practically flame proof. This disk is pressed against the lower wall of the flange 4 by screwing up the tube 5; and the latter may be secured in this position by a pin driven into suitable registering apertures in the ring frame and the tube. The upper bore of the ring frame is suitably closed, as by disk 8 of thin frangible sheet metal that may have its margins soldered on the upper face of the ring frame 2. This disk is for the purpose to permit escape of vapor or gas under pressure, as when a fire occurs in the vicinity, or undue heat in the tank which may melt the solder, and the disk will blow off, thereby permitting escape of gas under pressure through the apertures in the disk. But it will be understood that these fine apertures prevent flame above such plate passing down into the tank, that would cause an explosion. But in case a dangerous pressure is produced in the tank without the heat melting the solder of the top disk 8, this thin frangible disk will become ruptured and provide escape of the confined gas and vapor through the apertured disk 6.

When the contents of the tank are withdrawn, to admit air I provide a check valve 7 in a suitable bore at one side of the casing 2. The gasket 9 may be used where the closure seats on the filler 2.

Closures of this character are very frequently removed for filling, that with the usual screw-threaded connection with the tank, often produce trouble, because in replacing the closure the cap is not started straight with the threads properly engaged, and the thread is damaged that will prevent proper closure or tightening of the cap. To avoid this another kind of joint known as a bayonet joint is preferable, and two or more lugs are provided that engage in similar projections or socket portions at the opening into the tank. For this purpose, I simply attach a bar to the locking tube 5. This bar 10 is passed through apertures 11 and 12 on opposite sides of the tube 5, with the end portions projecting beyond the tube. These projecting ends provide lugs for engagement with similar portions 13 and 14 in the tank bung 15. The flange portion 16 projecting down from the ring frame 2 encloses the ends of the bar 10.

Devices of this kind are easily misplaced or lost, or may fall to the ground and dirt or foreign particles get into the same. To overcome this objection I apply a flexible

connection to the closure that is fastened to the tank, which permits the device to be withdrawn from the aperture and the cap will rest on the tank beyond the same during the filling operation. As shown, a chain 17 has a link end 18 passed around bar 10; and a cross bar 19 of the chain extends into the tank and limits outward movement of the chain.

The same holding chain or connection is used to complete an electric circuit to the bottom or other part from the tank cap, and forms a convenient outlet for a static charge, sometimes produced by the operation of the gasoline pump. It is well known that a person can accumulate a kind of static charge, and the first object that may be touched may conduct away such a charge, as when a person walks through a room and then touches a chandelier. A person having such a charge might return the cap to the tank, and the charge would tend to ignite the gasoline vapor before the cap is applied. But by having this chain go down to the bottom of the tank, or otherwise secured to the tank on the person touching the cap, the static charge will pass at once to the tank, and the latter being grounded on the car frame, will absorb and dissipate the static charge and thus prevent it passing to the vapor and igniting same to cause an explosion.

While a bayonet joint is shown and preferred, obviously the bore 11 of the cap can be screw-threaded to engage external threads 20 on the filler tube or bung.

When a tank cap of the present type is removed and a person having more or less of a static charge unscrews the cap and withdraws it from the tank, and a break is thus effected between the cap and the filler top or opening. It is this break that causes the charge to jump and produce the well known spark, at the spark gap. The common form of gas lighting systems are ignited by an electric spark, and many explosions are produced from just such cases. But with my novel arrangement of a chain on the cap always connected with the tank, removal of the cap makes no break in the circuit and therefore no spark is produced, and such danger eliminated.

It has been found on demonstration that the flowing of gasoline through or from a hose, especially a hose nozzle, produces a static accumulation and charge. With my arrangement of chain and cross bar, the gasoline filling hose nozzle will at once engage this cross bar on the chain, and such charge is conducted away through the tank, the chain being of sufficient length to remain engaged with the tank and the bottom wall of the tank. And when the gasoline is flowing in, it will first strike this cross bar and chain, that would tend to cause a spark between the incoming gasoline, and vapor in the tank, but the charge is thus led away by the chain.

A ball 22 is shown on the lower end of the chain 17, that will roll around the tank and preserve good contact for conducting the charge of the tank.

What I claim is:

1. A safety closure comprising a ring frame having its bore screw-threaded and an annular flange projecting into the bore above the threaded portion, a threaded tube engaging said threaded bore, a finely perforated disk held against said flange by said tube, said tube having opposite openings at its free portion, and a bar extending across the tube at said openings with free projecting ends beyond the top.

2. A safety closure comprising a ring frame having its bore screw-threaded and an annular flange projecting into the bore above the threaded portion, a threaded tube engaging said threaded bore, a finely perforated disk held against said flange by said tube, said tube having opposite openings at its free portion, a bar extending across the tube at said openings with free projecting ends beyond the top, and a flexible connector carried by said bar of a length to reach the bottom of the container.

3. A safety closure comprising a ring frame having its bore screw-threaded and an annular flange projecting into the bore above the threaded portion, a threaded tube engaging said threaded bore, a finely perforated disk held against said flange by said tube, said tube having opposite openings at its free portion, a bar extending across the tube at said openings with free projecting ends beyond the top, a flexible connector carried by said bar of a length to reach the bottom of the container, and a stop device on the connector for engagement with the container to limit the movement of the closure away from the opening of the container.

4. A safety closure comprising a ring frame having its bore screw-threaded and an annular flange projecting into the bore above the threaded portion, a threaded tube engaging said threaded bore, a finely perforated disk held against said flange by said tube, and a plate of readily frangible metal secured on the frame closing the bore adapted to be ruptured on predetermined internal pressure, said tube having opposite openings at its free portion, a bar extending across the tube at said openings with free projecting ends beyond the top.

5. A safety closure comprising a ring frame having its bore screw-threaded and an annular flange projecting into the bore above the threaded portion, a threaded tube engaging said threaded bore, a finely perforated disk held against said flange by said tube, a plate of readily frangible metal se-

cured on the frame closing the bore adapted to be ruptured on predetermined internal pressure, said tube having opposite openings at its free portion, a bar extending across the tube at said openings with free projecting ends, and a flexible conductive connector carried by said bar and secured to the container.

6. A safety closure comprising a ring frame having its bore screw-threaded and an annular flange projecting into the bore above the threaded portion, a threaded tube engaging said threaded bore, a finely perforated disk held against said flange by said tube, a plate of readily frangible metal secured on the frame closing the bore adapted to be ruptured on predetermined internal pressure, said tube having opposite openings at its free portion, a bar extending across the tube at said openings with free projecting ends, and a flexible conductive connector carried by said bar, a stop device on the connector for engagement with the container to limit the movement of the closure away from the container opening, the connector being of a length to remain engaging the bottom of the container.

Signed at New York city, N. Y., on Dec. 2, 1924.

WILLIAM H. McNUTT.