May 14, 1929. C. F. H. BOHNHARDT 1,712,977

TRUCK TANK LOADING CAP

Filed Dec. 14, 1927

Fig. 1

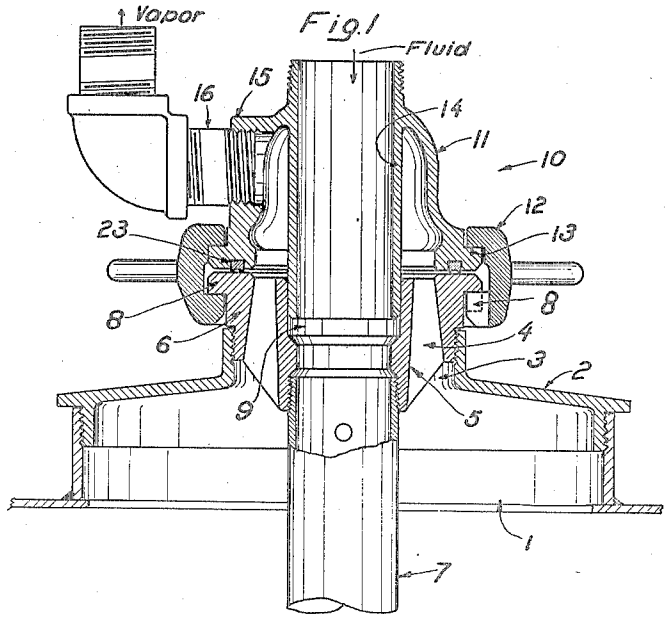
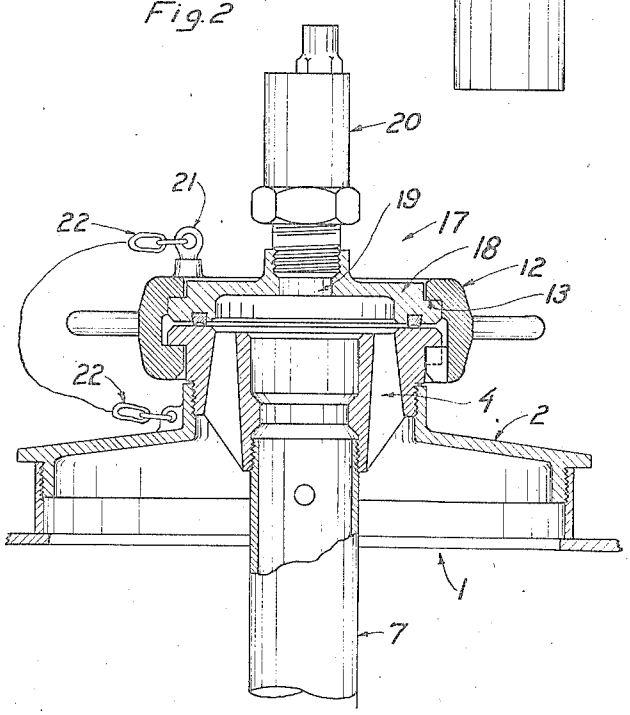


Fig. 2



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UNITED STATES PATENT OFFICE.

CHARLES F. H. BOHNHARDT, OF LYNWOOD, CALIFORNIA.

TRUCK-TANK LOADING CAP.

Application filed December 14, 1927. Serial No. 239,975.

My invention relates to the art of transporting volatile liquids, with particular reference to truck tanks for carrying gasoline.

In handling easily volatilized liquids, such as gasoline and especially casing head gasoline, large evaporation losses are incident to tank loading because of the turbulence and spraying of the stream of incoming liquid where the loading is accomplished by freely discharging the liquid into the tank through a manhole or other opening in the top. In open filling, the possibility of filling the tank until the fluid runs out of the filling opening is always present, with its attendant danger. The object of my invention is to provide a highly advantageous means for the loading of such liquids and in particular the objects of my invention are

1. To do away with open filling of a tank.

2. To prevent loss of vapor during the filling of a tank with a volatile liquid.

3. To reduce fire hazard when handling such liquids as casing head gasoline.

4. To provide a quickly operated means for attaching the liquid conveying and vapor conveying pipes to the tank to be filled.

I accomplish these objects with the mechanism illustrated in the accompanying drawing, in which

Figure 1 is a sectional elevation of my filling nozzle in position on the tank and

Figure 2 is a sectional elevation of the traveling cap in position on the tank.

Referring to Figures 1 and 2, numeral 1 designates any usual or preferred manhole opening in a truck tank top, wherein a usual or preferred manhole cover 2 is secured, said cover being provided with a central threaded opening 3. A bushing 4 is adapted to screw into opening 3 and is provided with a central hub 5, which is carried on four webs so as to leave a clear upward passage between the webs, the outer annular ring 6 and the hub 5. Extending downward from hub 5 and threaded thereto a pipe 7 depends, its bottom end clearing the tank floor by about 1 inch. The upper portion of the hole through hub 5 is bored out to a preferred diameter to form the recess 9. The top end of ring 6 is machined flat. Two threaded segmental projections 8, carrying an interrupted thread, are formed on the outer surface of the ring 6. These projections are diametrically opposed and each segment subtends about 80° of the circumference. The bushing 4 becomes a permanent part of the manhole cover 2, or obviously it could advantageously be screwed into the ringed opening formed directly in the tank without the use of the manhole cover.

Referring to Figure 1, the filling nozzle assembly generally designated by numeral 10 is composed of a bell shaped casting 11 adapted to rest on the top of bushing 4, secured thereon by a ring nut 12 operating on the aforementioned interrupted thread 6 and on an annular shoulder 13 formed on the bottom of casting 11. The thread on ring nut 12 is also interrupted, thus permitting it to be placed over bushing 4 and tightened with an eighth turn. A gasket ring 23 of soft lead is secured in the end of casting 11, adapted to seat on the flat end of annular ring 6 to form a gas tight joint at low pressures. Extending centrally through casting 11 there is a tube 14 cast integral with the casing, this tube extending about its own diameter below the bottom of the bell and for this distance being turned to a sliding fit in the upper bore 9 of the hub 5. The upper extension of tube 14 through the bell is externally threaded to fit the pipe size desired for filling the tank. A lateral projecting hub 15 is provided, internally threaded to receive nipple 16 and communicating with the space inside the bell and outside tube 14.

The filling nozzle assembly constitutes a part of the equipment of the loading rack. The fluid conveying pipe is secured to the tube 14 and the vapor pipe to nipple 16, both lines being provided with the necessary number of swing joints or other flexible means to permit the filling nozzle to be swung upwards out of the way of trucks when not in use. The operation of filling a tank then consists in removing the traveling cap, to be described later, and securing the filling nozzle to the bushing 4. The fluid comes to tube 14 and passes down through pipe 7 discharging at its open end directly onto the floor of the tank. In this manner practically no liquid is volatilized because very little turbulence is set up and the liquid is not allowed to fall freely through gas filled space. The vapor in the tank passes up between hub 5 and ring 6 into bell 11, and out

into the vapor line through nipple 16 to any desired point of or apparatus for disposal. If the tank is inadvertently filled to overflowing, the excess fluid escapes through the vapor line and is neither wasted nor allowed to contaminate the ground, thus greatly reducing the fire hazard. The ring nut illustrated is a preferred and convenient manner of attaching the filling nozzle 10 to the bushing 4 but with a small decrease in conveniency it can be readily attached by means of the well known swing bolts and swing nuts.

After the tank is loaded the filling nozzle is removed and the traveling cap generally designated by numeral 17 is applied. This cap consists of a casting 18 adapted to fit and to be secured on bushing 4 in the same manner as the filling nozzle. This casting requires but one outlet 19 in which the vent valve 20 is connected. A pin 21 is provided which passes downward through a hole drilled in the ring nut 12 and bushing 4 so that these holes match when the traveling cap is clamped in position. If desired an eye can be formed in the bottom end of this pin where it extends through the ring nut, through which the loop of a padlock, not shown, can be passed, thus adequately locking the cap in place. Accidental loss of the pin 21 is prevented by the chain 22 which flexibly secures it to the manhole cover.

A preferred material for the bushing 4, ring nut 12, and bell 11, is one which is incapable of striking sparks, such as brass, bronze or aluminum.

By the use of my improved cap the tank is open to the atmosphere but a few seconds; only during the time required to lift off the traveling cap and to apply the filling nozzle. This time is not sufficient to allow an appreciable degree of air mixture with vapor or escape of vapor from the tank. If the vapor is inflammable this prevents the formation of explosive mixtures; or if the vapor is noisome it is not allowed to contaminate the immediate air.

The utility of my invention is not limited to gasoline-carrying truck tanks as it can also be advantageously applied to any container used for handling liquids, where difficulties similar to those incident to the loading of gasoline are encountered.

I claim as my invention:

1. A truck tank filling device, comprising: a base block adapted to be permanently screwed into said tank; a liquid conductor permanently attached to said base block and reaching substantially to the bottom of said tank; ports through said base block for the passage of vapor; a hollow block bearing nonleakably on said base block and means for quickly attaching said hollow block to said base block and for quickly detaching the same; a fluid inlet connection integral with said hollow block and adapted to communicate solely with said liquid conductor when said hollow block is attached to said base block, and a vapor outlet integral with said hollow block and adapted to communicate with the interior of said tank through said ports in said base block.

2. A truck tank filling device, comprising: a liquid conveying means fixed in said tank and extending substantially to the bottom thereof; a unitary adapter for permanent retention on the filling hose and vapor disposal hose and comprising a liquid inlet connection communicating with said liquid conveying means and a vapor outlet connection communicating with the vapor space in said tank when said adapter is attached to said tank, and means for quickly attaching said adapter to said tank without detaching said adapter from said hose.

In witness that I claim the foregoing I have hereunto subscribed my name this 7th day of December, 1927.

CHARLES F. H. BOHNHARDT.