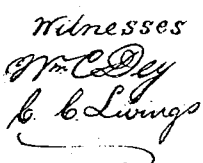


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United States Patent Office.

HENRY F. SNYDER AND GEORGE S. SNYDER, OF WILLIAMSPORT,
AND ANTES SNYDER, OF BLAIRSVILLE, PENNSYLVANIA.

Letters Patent No. 93,918, dated August 17, 1869.

IMPROVEMENT IN OIL-TANKS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, HENRY F. SNYDER and GEORGE S. SNYDER, of Williamsport, in the county of Lycoming, in the State of Pennsylvania, and ANTES SNYDER, of Blairsville, in the county of Indiana, in the State of Pennsylvania aforesaid, have invented certain new and useful Improvements in Tanks, intended more especially for the bodies of railroad-cars employed in the transportation of crude petroleum; and we do hereby declare that the following is a full and exact description thereof,

Our improvements relate to the means for discharging the oil, and for very safely securing the discharging-apparatus against leakage, accident, or improper meddling.

We will first proceed to describe what we consider the best means of carrying out our invention as applied to a cylindrical tank, supposed to be mounted on suitable running gear, to serve as a railroad-car, and will afterward designate the points which we believe to be new.

The accompanying drawings form a part of this specification.

Figure 1 is a cross-section, through the entire tank, and the appurtenances relating to the discharge-valve, with the valve closed and effectually secured;

Figure 2 is an end elevation, partly in section, showing the safety-devices removed, the hose connected, and the valve open, to allow the discharge; and

Figure 3 is a top view of the valve alone, on a larger scale.

Similar letters of reference indicate like parts in all the figures.

A is the shell of the tank, formed of boiler-iron or other suitable material.

B B' is a hollow casting, tightly riveted or otherwise secured around a hole in the bottom of the shell A, and which presents a seat, *b*, for the valve.

It is threaded around its lower end, to receive the hose, as shown in fig. 2, and is recessed at B' to receive the heads of screw-bolts C C', which firmly secure, by means of nuts *c*, a stirrup, D, which is threaded to receive a corresponding screw-thread upon the rod E, which controls the valve.

This rod E extends down through the tank, and is embraced, at or near its upper end, within a casting, H H', &c., which is riveted or otherwise tightly fixed around a hole in the top of the tank.

A little below the head E', the rod E passes through a contracted portion of the casting H, indicated by H¹.

Below this, it passes through a stuffing-box, H², tightened by adjusting a gland in the ordinary manner.

The head E', which is larger than the main cylindrical

portion of the rod, is enclosed within the upper portion of the casting H, and is protected from the weather, dust, &c., by the cap I, which is retained by the spring J, and also loosely tied by the chain K, to insure against its loss when taken off.

The rod E' is necessarily inserted from the top, and the stuffing-box is packed after the rod is inserted.

It will be seen, by a brief inspection of the drawing, that the valve is opened by turning the rod E in one direction, and is closed by turning the same rod in the opposite direction, and that by reason of the head E' being enclosed within a portion, H², of the casting H, which is a little larger than the head E', it is impossible to operate the valve, except by first removing the cap I, and then introducing a wrench or key, which is very carefully fitted to perform this duty. It must be adapted to match on the head E', and it must also be sufficiently small to apply within the contracted interior of the enclosing casting.

The proper officers only are provided with such keys, and other parties cannot operate the valve, even if they obtain access to the cars.

It is necessary to provide for a number of contingencies and conditions, the importance of which will be appreciated by those in the business.

First, the springing of the tank, and particularly when only partially filled with oil and subjected to irregular and surging motions, renders it imperative that the valve shall have slack, and not be lifted off its seat except when desired.

It is also important to close the locking-devices as much as possible within the tank, to provide for the easy removal of the parts for repairs, and especially to provide against great loss of the fluid, in consequence of any small leakage of the valve.

It is also important that all the operations from the outside may be properly effected by ignorant and only ordinarily skillful persons; also, that while the valve has slack, the rod should be packed so as to prevent the escape of gas. This, when allowed to escape, settles around the tank, and explodes on coming in contact with a light.

We arrest the fluid which leaks past the valve by means of a tight-fitting cap, L.

This fits on the threaded portion of the casting B, in the same manner as the coupling of the hose, and is provided with a swivelling-piece, *l*, and is secured by a chain, *l'*, and thus insured against loss when removed.

The cap L carries a set-screw, *m*, which is set up against the casting B, above the screw-thread *b'* and thus holds the whole very firmly after the cap is tightened.

It is very important that the part B^3 , against which this set-screw is tightened, should be larger than the screw-thread, so that as soon as the set-screw m is slackened sufficiently to allow the cap to be turned, the cap may be turned quite off without further drawing back of the set-screw. Without this precaution the screw would soon be injured, through unskilful manipulation.

The securing effected by setting the screw m tightly against the enlarged surface B^3 may be in part accomplished, but in a much inferior manner, by providing teeth on the cap L , and a pawl fastened to the casting B , or in various other ways, if preferred.

It will be understood that the lower end of the casting B is smoothly finished, and that the interior of the cap L carries a ring, of rubber or other suitable material, to form a perfectly tight joint therewith.

We make the casting B of considerable depth, as indicated, and, by making the valve conical and hollow, are able to extend the rod E down in the hollow interior, so as to form a bearing near the apex or lower point of the inverted cone.

The force employed to press the valve to its seat being applied at this point, below the bearing-surface of the valve, tends always to force the valve to a correct and fair bearing, and to avoid the tendency which might otherwise be developed, to tilt or incline in various directions, and thus become deranged and leaky.

The main body of the valve is indicated by G .

The seat, which is very carefully ground and fitted, is indicated by g ; four wings, which assist in guiding it, by G^1 ; the seat which receives the downward thrusting pressure of the rod E by G^2 ; the top of the main part by G^* ; and the peculiarly-formed hole therein by G^3 ; a separate piece, bolted on the top, by G^4 ; and a peculiar hole therein by G^5 ; and the parts are held together by bolts G^6 .

The screw-thread e takes hold of the valve, to raise it, through the medium of a peculiar thimble, $N^1 N^2$.

The extreme lower end of the rod E is turned smaller than the part e , which is threaded for the stirrup D , and is provided with a screw-thread, e' , cut in the reverse direction to the main screw-thread e , which operates the valve.

The thimble N is fitted on this small screw-thread e' , and is set up tightly on the rod E , so as to operate as a part of the same. In other words, the thimble $N^1 N^2$ turns with the rod E , and operates in all respects as a part thereof.

Its upper end is made of an angular form, to aid in applying it on the rod E . It also enables one to screw it up tight against the shoulder, without taking anything apart, should it by any means become loose.

Its centre is made small, to run in the valve.

Its lower end, N^2 , is enlarged, and, by applying under the part G^* of the valve, lifts the latter off its seat, to discharge the oil when required.

This thimble, by reason of the difference in the direction of the two screws, will never be screwed off in the ordinary use of the valve.

Should the valve stick in raising, so as to press sufficiently on the thimble to cause the rod to turn in it, the tendency will be to tighten instead of loosening it.

In closing the valve, the pressure being at G^3 , at the end of the rod, and not at the thimble, there will never be sufficient pressure to turn the rod.

The peculiar holes G^3 and G^5 , in the parts G^* and G^4 , allow the parts to be applied together.

The operation of applying them will be readily understood by good mechanics.

The bolts G^6 being removed, the part G^4 is displaced laterally, on the main part of the valve, until the largest part of the holes G^3 and G^5 coincide.

In this position the head N^2 of the thimble is inserted, and afterward the top plate G^4 , being moved laterally to its proper position, and the bolts G^6 being inserted and turned down tightly, the whole is in place ready to serve, as above described, for an indefinite period.

It will be observed that these parts cannot be put together or taken apart, except by a man in the interior of the tank, who enters through a man-hole, not represented, and can effect these operations at any time when the tank is empty.

By inserting the heads of the bolts C in the recesses cored in the casting B , as represented, we are enabled to connect the stirrup D very strongly and conveniently, without increasing the number of holes or points at which the tank may leak. And by making the entire stirrup D and its connections smaller than the casting B , and riveting the latter entirely outside of the stirrup, we are able to insert and remove the whole together.

Having now fully described our invention,

What we claim as new, and desire to secure by Letters Patent, is as follows:

1. We claim the locking-means m , in combination with the cap L , attachments l , casting B , and valve G , and arranged to operate therewith, substantially as and for the purposes herein specified.

2. We claim the tank A , valve G^* , rod E , screw-thread e , and stirrup or yoke D , combined and arranged substantially as and for the purposes herein set forth.

3. We claim the hollow interior of the valve G , extended downward, and with it the bearing-point g , for the operating-rod E , below the bearing-surface or seat g , substantially in the manner and for the purposes herein set forth.

4. We claim the within-described construction and arrangement of the yoke or stirrup D , and casting B , with their attachments, so that those parts may be inserted and removed together, as and for the purposes herein specified.

5. We claim the enlarged head E' , on the rod E , enclosed in the casting $H H^1$, combined and arranged with the tank A , and valve G^* , to secure the contents still further against improper meddling, substantially in the manner and for the purposes herein set forth.

6. We claim the top cap I , spring J , and loose connection K , constructed and arranged as represented, relatively to the casting $H H^1$, head E' , rod E , valve G^* , and tank A , for the purposes herein set forth.

In testimony whereof, we have hereunto set our names, in presence of two subscribing witnesses.

H. F. SNYDER.
G. S. SNYDER.
ANTES SNYDER.

Witnesses:

T. C. ROGERS,
H. D. HEISER,
WM. RANSON,
R. B. McCABE.