H. F. SNYDER.

Oil-Tank Car.

No. 223,867. Patented Jan. 27, 1880.

FIG. 1.

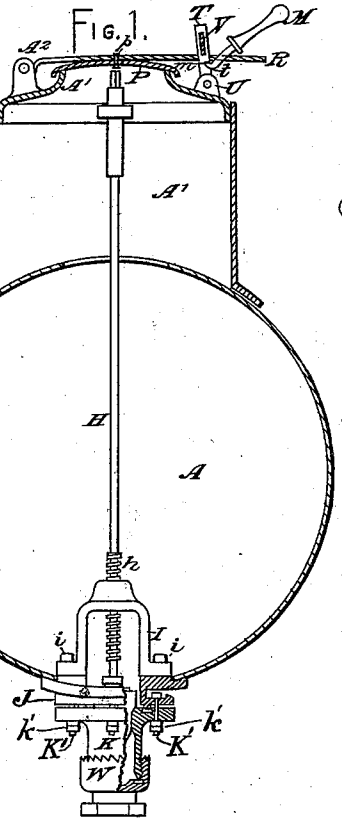


FIG. 2.

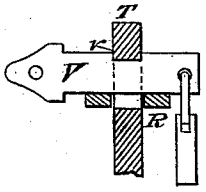


FIG. 5.

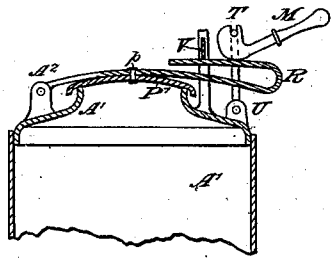


FIG. 3.

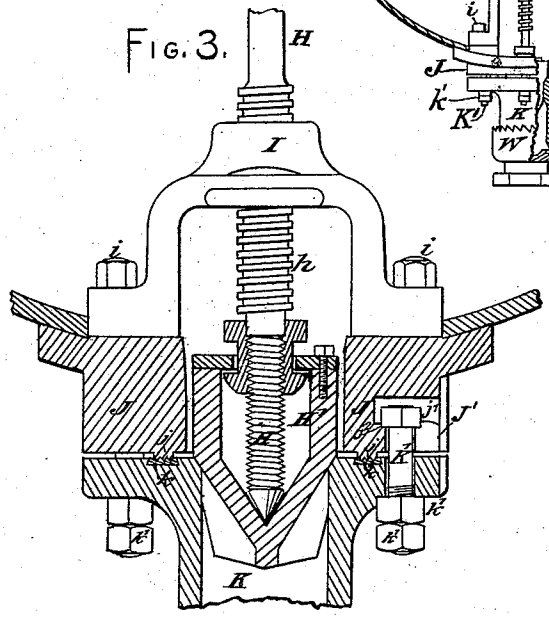
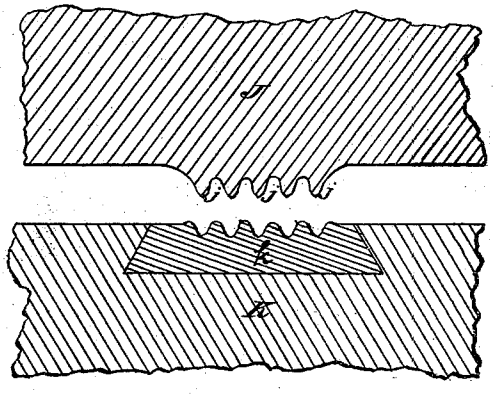


FIG. 4.



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UNITED STATES PATENT OFFICE.

HENRY F. SNYDER, OF WILLIAMSPORT, PENNSYLVANIA.

OIL-TANK CAR.

SPECIFICATION forming part of Letters Patent No. 223,867, dated January 27, 1880.

Application filed May 8, 1879.

To all whom it may concern:

Be it known that I, HENRY F. SNYDER, of Williamsport, Lycoming county, in the State of Pennsylvania, have invented certain new and useful Improvements relating to Oil-Tank Cars for Railroads, of which the following is a specification.

I have devised means for operating and securing the outlet-valve, which means afford increased facilities for access, and for the repair and exchange of parts by the proper parties, and I have introduced means for better securing the parts against any fraudulent or mischievous tampering therewith by improper parties.

It is important that the cover of the man-hole at the top be secured with sufficient tightness to avoid serious loss from slopping, due to irregular motions, and especially that adequate fastenings be provided which may not be easily opened by unauthorized persons, and that both cover and fastenings be removed entirely out of the way for filling the car and for allowing access to the valve-rod for emptying the car.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a general cross-section through the entire tank or body of the car with my improvements applied. Fig. 2 represents the cross-key which confines the elastic lever at the top or some of the adjacent portions, on a larger scale. Fig. 3 is a section showing the valve and some of the adjacent parts at the bottom. Fig. 4 is a vertical section through the ridges and grooves, on a still larger scale. Fig. 5 is a cross-section, showing a modification of the elastic lever and means for operating it.

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

A is the body of the oil-tank, formed with the usual high dome to properly elevate the man-hole which is formed in the casting A′ at the top. H is the operating-rod, formed with a screw-thread, *h*, on a slightly-enlarged portion, which fits in corresponding screw-threads in a yoke, I, secured by bolts *i* to the casting J, which is bolted on the aperture formed in the bottom of the tank, and performs some of the usual functions of the principal casting at this point. But the chief function of the casting—that of forming a seat for the valve H′—is reserved for a supplementary casting, K, which is removable to facilitate repairs and exchanges. It is strongly held by screw-bolts K′, the bodies of which are received in slots *j′* in the flange J′, and are secured by nuts *k′*. On removing these nuts *k′* the supplementary casting K, with its attachments, may be removed. The attachments may be similar to those set forth in the patent to myself and brothers, George S. Snyder and Autes Snyder, May 23, 1871, No. 115,127, and need not be particularly described.

W is a bottom cap, which applies tightly on the lower end of the casting K, performing the same functions as the corresponding cap in the previous patent referred to.

It is necessary, in order to confine petroleum, to make special provisions for the tightness of the joint between the supplementary casting K and the main casting J. It is also necessary, in order to allow the supplementary casting to fulfill the important function of a seat for the valve, that it be confined with unusual certainty in an exact position, so that the valve-seat will be strictly concentric to the valve and to the prolonged axis of the valve-rod H. I attain both these ends by the aid of a series of circular ridges, *j*, to accurately turn on the lower face of the casting J, and which match into corresponding grooves in a soft-metal surface, *k*, formed in the supplementary casting K. These ridges *j* are of V-shaped section, and match into corresponding grooves of less width and depth which are formed for them, or which they may form for themselves, in the soft metal *k*. A greater or less number of these circular ridges and corresponding grooves may be employed. I employ four, making each an eighth of an inch in breadth, and provide a soft-metal belt about three-quarters of an inch in width, in which the ridges are allowed to partially embed themselves.

When the casting K is brought up to a bearing, and the nuts *k′* are applied on the bolts K′, it is easy to bring the casting K into an

approximately correct position. The bolts K′ being first inserted in their proper slots, the casting K must be in the approximately correct position, or its holes will not match on the bolts. Thus conditioned, on applying the nuts and bringing the casting K up to its bearing, the inclined sides of the ridges *j* act on the counter-surfaces of the grooves in the lower part and guide the casting K with mathematical exactness to its true position. When the parts are properly forced together the casting K is certain to be exactly concentric to the valve.

The separation of the parts will be readily understood. The valve H′ having been previously raised and all the oil emptied from the tank, the nuts *k′* are removed and the casting K lowered.

The large aperture which my invention provides through the main bottom casting J allows me to take out the yoke I and insert another through the same, when necessary, by properly manipulating the fastenings, giving the proper crooked motion to the crooked piece which is to be thus removed.

When a tank stands empty, and the interior of these parts are simply smeared, not covered, with petroleum, the partial oxidation or other action which occurs in the semi-fluid material is liable to cake and form a strongly-adhesive coating on the surfaces. I prefer the use of soft metal as the material *k* to receive the grooves, both for the facility which it affords for making the grooves and for the superior effect which obtains when the parts are violently separated after a hard cementing cake has formed.

If, on removing the nuts *k′*, the casting K will not drop of itself in consequence of the adhesion referred to, it can be started by one or more smart raps with a wrench, or by the insertion of a pry or chisel in the joint.

I have in my experiments used a soft alloy, principally lead, for the material *k*, and find the adhesion very slight thereon.

R is an elastic lever extended across the man-hole and riveted to the cover P at the point *p*. It is hinged to the fixed parts A′ by an eye, A^2. It is held down at the other end by means of a swinging link, T, which stands loosely inclosed in a slot in the lever R, and is provided with a cross-key, V, notched, as shown, so that while the spring-lever R forces the cross-key V up into firm engagement with the link T, the notch in V holds it firmly locked.

The lever R is elastic, and is so held by the pin V that some of its elasticity is made available. It is strained, and exerts a constant pressure to hold the cover P firmly down upon the casting A′; but the lever R has more elasticity, and its end which engages with the link T is capable of being further depressed. Such depression is necessary in engaging and disengaging it. It may be conveniently effected by means of the small portable hand-lever M, which is formed with a hooked end, *m*, adapted to engage in the notch *t* in the edge of the link T. The slot in R is sufficiently long to allow the lever M to be inserted and turned.

To close the man-hole, the link T, not having yet received the cross-pin V, is held upright. The cover P and its attached lever R are brought over, turning on the eye A^2, and the lever R receives the link T in its slot. Now the lever M is applied and its hook *m* is engaged in the proper notch, *t*. Next the lever M is depressed by the force of one hand of the attendant, thus forcibly bending down the lever R to its fullest extent. In this condition of the parts the cross-pin V is introduced with the notch *v* uppermost, and held in the link T. Now the lever R is allowed to partially rise to its natural position by the elevation of the lever M. This movement forces the notch *v* tightly into engagement, and the parts are firmly secured, after which the lever M may by an easy movement be liberated and taken away to serve on other cars.

The opening of the tank involves a reverse of these operations, and the link T is now free to be turned down on its hinge U out of the way. The eye A^2 may be also formed with a link, so as to allow also of being turned down out of the way, if desired. This latter will afford a perfectly clear way on all sides of the man-hole for the free movement and application or renewal from any side of a pipe or other apparatus for introducing or removing oil; but I prefer the construction represented.

The pockets j^2, which receive the heads of the bolts K′, are square, and are sunk sufficiently to hold the head against turning. They attain two important ends. When the removable casting K is removed these pockets j^2 hold the several bolts K′ in the right position for each bolt to exactly match in its proper bolt-hole when the casting is again brought up to place; and they also hold each bolt against being turned around in its seat when the nuts *k′* are being put on or taken off.

Fig. 5 shows a modification in which the elastic lever R, instead of being a plain flat bar of nearly straight form, and only a little more than the required length, may be considerably longer, and bent so as to afford a great amount of elasticity without being undesirably weakened. The means provided for fastening such a modified lever may be the same as before, or may be modified, as indicated in the figure, to better adapt the fastening to the modified form of lever.

I can succeed with only one notch, *t*, in the edge of the link T, as shown; or, instead of a single notch, *t*, to receive the joint or fulcrum of the hand-lever M at a uniform level, I can provide a series of notches, *t*, one above another, so that the lever M may be shifted from one to another, as required, to easily and completely depress the lever R.

Instead of carrying on the person of the attendant the peculiarly-formed lever M to depress the elastic lever R, I can, if desired, attach it permanently, but flexibly, to the oil-tank by a chain of sufficient length to allow it

to be applied when required. The chain will prevent its being lost. In such case I can employ a padlock inserted through a hole in the lever M and allow the attendant to carry the key of that padlock on his person; or I can employ both these means of security by causing the attendant to carry away both the lever M and the key of the padlock.

Further modifications may be made. I believe that some of the advantages may be obtained by the use of the ridges *j*, applying in corresponding grooves with inclined faces formed in hard metal on the lower casting, K; but I prefer the soft metal for the reasons stated. The ridges corresponding to *j* may be formed in the lower casting, and the grooves in the upper ridges need not be strictly V-shaped. They may have a considerable width at the bottom; but the inclination of the faces, either of the ridges *j* in the one part or of the grooves in the other part, or of both, is important to aid in guiding the parts to their position. Ridges with perpendicular sides matching in corresponding grooves would perform the same function imperfectly. Such would require that the lower casting, J, be moved to find the right position, the parts only matching together after the proper position had been found by trial.

I can increase the elasticity of the springing-lever R by various devices. It may be corrugated transversely.

I claim as my invention—

1. In combination with the oil-tank A, valve H′, and its operating-rod H, raising and lowering the valve by means supported on the fixed part J, the detachable piece K, with suitable securing means, adapted to be removed and exchanged without disturbing the part J and its other attachments, as herein specified.

2. The oil-tank A, valve-rod and valve H H′, formed with a screw-thread, *h*, threaded yoke I, bottom casting J, detachable valve-seat K, soft-metal surface *k*, ridges *j*, and bottom cap W, combined and arranged to serve as herein specified.

3. The oil-tank A, man-hole rim or covering A′, and cover P, in combination with elastic lever R, key V *v*, and holding-link T, as herein specified.

4. The oil-tank A A′, cover P, elastic lever R, and confining-key V *v*, in combination with a swing-link, T, having a notch or notches, *t*, and with an operating-lever, M, made detachable, as herein specified.

5. In oil-tank fittings, the bottom casting J, formed with a flange, J′, having slots *j′* and pockets j^2, in combination with the removable supplementary casting K and holding-bolts K′, as herein specified.

In testimony whereof I have hereunto set my hand this 2d day of May, 1879, in the presence of two subscribing witnesses.

HENRY F. SNYDER.

Witnesses:
THOMAS D. STETSON,
CHARLES C. STETSON.