H. F. Snyder, J. S. Snyder and A. Snyder

Oil Tanks,

Fig. 1.

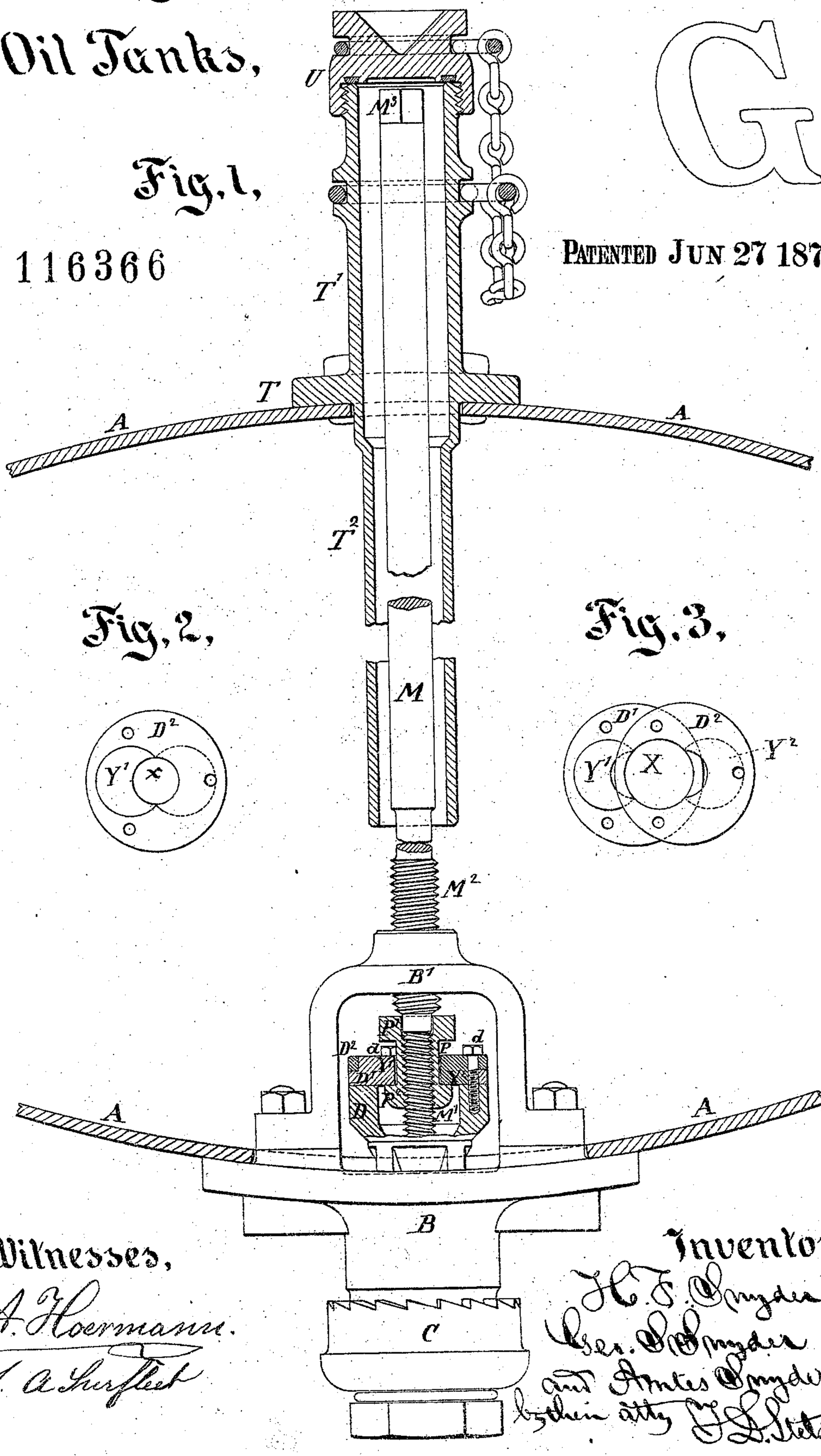

Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

HENRY F. SNYDER AND GEORGE S. SNYDER, OF WILLIAMSPORT, AND AUTES SNYDER, OF FREEPORT, PENNSYLVANIA.

IMPROVEMENT IN OIL-TANKS.

Specification forming part of Letters Patent No. 116,366, dated June 27, 1871.

To all whom it may concern:

Be it known that we, HENRY F. SNYDER and GEORGE S. SNYDER, of Williamsport, Lycoming county, and AUTES SNYDER, of Freeport, Armstrong county, State of Pennsylvania, have invented certain new and useful Improvements in Oil-Tanks and their appurtenances.

Our tank is adapted to be carried on and to form a part of a railroad car for the transportation of petroleum. It may be used for analogous purposes, if desired. The invention relates to provisions at the top, whereby the shaft, which operates a valve at the base, is extended up through an elongated neck, which extends up above the top of the tank. This allows access to the shaft for operating the valve without spilling the oil when the tank is overfilled or stands in an inclined position, or is, from rapid motion or any other cause, liable to have the oil, either permanently or at intervals, tend to rise above the top of the tank. The invention also relates to extending the base of such neck or narrow inclosing-case downward from the orifice in the top of the tank, so as to better prevent evaporation or escape of vapor when the tank is only partially filled. It also relates to provisions on the valve for better taking hold of the shaft or operating stem.

The following is a description of what we consider the best means of carrying out the invention:

The accompanying drawing forms a part of this specification. The tank is represented as cylindrical, but only the upper and lower portions are shown.

In the drawing, Figure 1 is a vertical transverse section, partly in elevation. It shows the novel parts with so much of the ordinary parts as is necessary to indicate their relations thereto. Figs. 2 and 3 represent details detached. Fig. 3 shows them in condition for introducing the steam.

A A are portions of the boiler-iron which forms the body of the tank. B is the casting, which, with its cap C and proper adjuncts, is shown projecting from the lower side of the tank, and is ready to discharge the oil either directly or through holes, (not represented,) when required. It contains a seat for the valve, which seat is a little below the section, as will be understood. D is the body of the valve. A portion is conical, to match the conical seat. Above this it is cylindrical, and below this it is winged, to guide the valve truly to its seat. It is hollow in its interior, to allow the threaded operating stem to extend downward and press down on a point near the lower extremity of the valve. The lower portion of the operating screw is smaller than above, and is formed into a left-hand screw. Above this the larger portion is formed into a right-hand screw. The lower—the left-hand screw—is within the valve. The upper—the right-hand screw—takes in a stout strap or yoke, B′, which is fixed firmly on the casing A. I will designate the entire operating shaft by the single letter M, and will designate the several parts thereof M^1, M^2, &c. The left-hand thread is M^1 and the right-hand thread M^2. So far there is nothing novel. The left-hand thread M^1 works in a long nut, P, having two collars—the collar P^1 at the top and the collar P^2 at the bottom. The interval between these collars is thicker than the corresponding portion of the valve which is received between them, so as to allow an amount of play. The lower collar P^2 raises the valve. By operating the shaft M in the opposite direction the nut P is lowered until the valve D is prevented from descending further by resting on its seat. The continued descent of the shaft M with the nut P causes the point of the shaft M to bear fairly on its proper bearing in the interior of the base of the valve before the upper collar P^1 bears on the valve. The upper collar P^1 performs, therefore, no function in pressing the valve down to the seat. It, or the upper end of the nut P to which it belongs, performs an important function by preventing the valve from being lifted too high. When the operator at the top, in ignorance of the exact position of the valve, turns the shaft M to raise it to such a height as would induce any damage, the upper end of the long nut P strikes the yoke B′ and firmly arrests it. This prevents what might otherwise be a serious injury from striking the yoke B′ with the bolts *d*, which perform important duties. There are three or other sufficient number

of the bolts *d*. They pass through two peculiar rings or collars, D^1 and D^2, which form the top of the valve D. These rings D^1 D^2 have each a large hole, large enough to allow the passage of the collar P^2; but when they are properly in position they embrace the body of the nut P, as represented, so that the collar P^2, in raising the valve, bears a portion of the weight on one part, D^1, and another portion of the weight on another part, D^2. The parts D^1 D^2, which I will call valve-tops, may be exactly alike, formed from the same pattern. The hole in each is compound, and may be described as being made as follows: First, make a small hole, *x*, exactly in the center of each part D^1 D^2, and of a diameter very little greater than the diameter of the body of the nut P. Then make eccentrically to this a larger hole, X, a very little larger than the collar P^2. It will be seen that these holes partly coincide. The form is very clearly shown in Figs. 2 and 3. One face of each part D^1 D^2 is plane; the other face contains a large nearly crescent-formed projection placed eccentrically therein, and adapted to match into the eccentric hole X in the opposite part of the collar—that is to say, the eccentric projection Y^1 on the part D^1 fits into the eccentric hole X in the part D^2, and the eccentric projection Y^2 on the part D^2 fits into the eccentric hole X in the part D^1. Laying the rings or parts D^1 D^2 upon each other and slipping the upper one to a proper extent sidewise upon the lower to bring the large eccentric holes in line, the collar P^2 of the nut P is easily passed through. Then, after this is effected, the parts D^1 D^2 are moved back into their proper super-position upon each other. This brings the eccentric holes X out of line with each other, and (either directly or by turning the parts a little) brings the eccentric projection on the one opposite to the eccentric hole on its mate. In this position they will drop into each other so as to present much less thickness. This is done, and the body D of the valve being now presented in the proper position and the bolts *d* inserted, a connection is formed, which is strong and presents a perfect bearing for the work. It is easily made with ordinary tools, and requires no great skill or labor to properly construct it and to put it together and take it apart as often as may be desired. We can and for some reasons prefer to make the lower ring or collar D^1 in one piece with the main body D of the valve. The provisions for notching together are in such case exactly the same as above described, only the part D^1 being put on the valve D the structure is stronger and firmer. Above the screw-thread M^2 the main body of the shaft may be contracted. We prefer that it be a little larger within the tube T^2 than below it. The head M^3, when in its most elevated position, stands some eighteen inches, more or less, above the top of the tank A. T T^1, &c., is a casting surrounding the hole in the top of the tank, reaching upward by a part, T^1, and downward by a part, T^2. The part T^1 carries a cap, U, with suitable provisions for tightly securing packing, &c., to prevent a leakage of vapor and the intermeddling of improper persons. Such caps have been long known, and may be of any approved or suitable construction. The elevation of the neck T^1 above the top of the tank is important for the reasons intimated above.

The tank is liable to be filled quite to the top and a little more, so as to stand a little above the level of the tank in the neck T^1; or, if the tank is only moderately filled, and the valve with its shaft M^1 and appurtenances is placed near either end, the car is liable when standing on an incline, or from various causes, to be presented in positions where the valved end of the tank shall be so much lower than the other end that the removal of the cap U would cause an overflow of oil if the neck T^1 did not thus extend up. This allows the level of the oil to be inspected. The extension of the neck T^2 downward into the tank so as to nearly touch the yoke B′ is important under a different class of circumstances. When the tank A is only partly filled the space above its surface becomes strongly impregnated with vapor. Now when, under such circumstances, the cap U is removed to allow access to operate the shaft M, the vapor, by flowing out through the considerable space around the shaft M, causes annoyance and may induce conflagrations, and when the vapor in the tank is mingled with air in certain proportions may cause destructive explosions. We esteem it important under these and all conditions to isolate the air-space above the level of the oil as much as possible from all communication with the outside air. The neck T^2, extending down from the casting T, effects this end completely. When oil is withdrawn air can enter and take its place by descending through the neck T^2 and bubbling up from the open lower end of the neck T^2 to the surface. When the tank is being filled with oil there is liberal space for the air to escape through other means, and we can, if desired in any case, provide other vents to admit air to allow the oil to escape more freely when being withdrawn. Thus the neck T^2 induces no serious difficulties, and it performs the highly-important function of completely cutting off communication between the air and vapor in the body of the tank, and the shaft M and its inclosing casing, and, consequently, with the external atmosphere. The provision T^2 is of some importance all the time if the top cap U does not fit perfectly tight. In such case, instead of the constant leakage of vapor by its flowing from the entire tank, the only vapor leaked is the very small amount generated from the limited surface within the neck T^2. Although the screw-threads are shown as V-shaped they may be square, and we prefer to so have them for some reasons.

We claim as our invention—

1. The neck T^1 extending above the tank A and inclosing the shaft M, which operates the valve D, as and for the purposes specified.

2. The neck T^2 extending down into the tank

A, around the shaft M, and arranged relatively thereto and to the valve D, as and for the purposes specified.

3. The matched valve-tops D^1 D^2, each having a concentric and eccentric hole partly coinciding, and each having an eccentric crescent-like projection adapted to match into the eccentric hole in the other, and be applied upon and be removed from the collared nut P P^1 P^2 and valve D, as herein specified.

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

H. F. SNYDER.
G. S. SNYDER.
AUTES SNYDER.

Witnesses:
T. C. ROGERS,
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