A. W. ELKINS.

TANK CAR VENT.

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1,205,443. Patented Nov. 21, 1916.

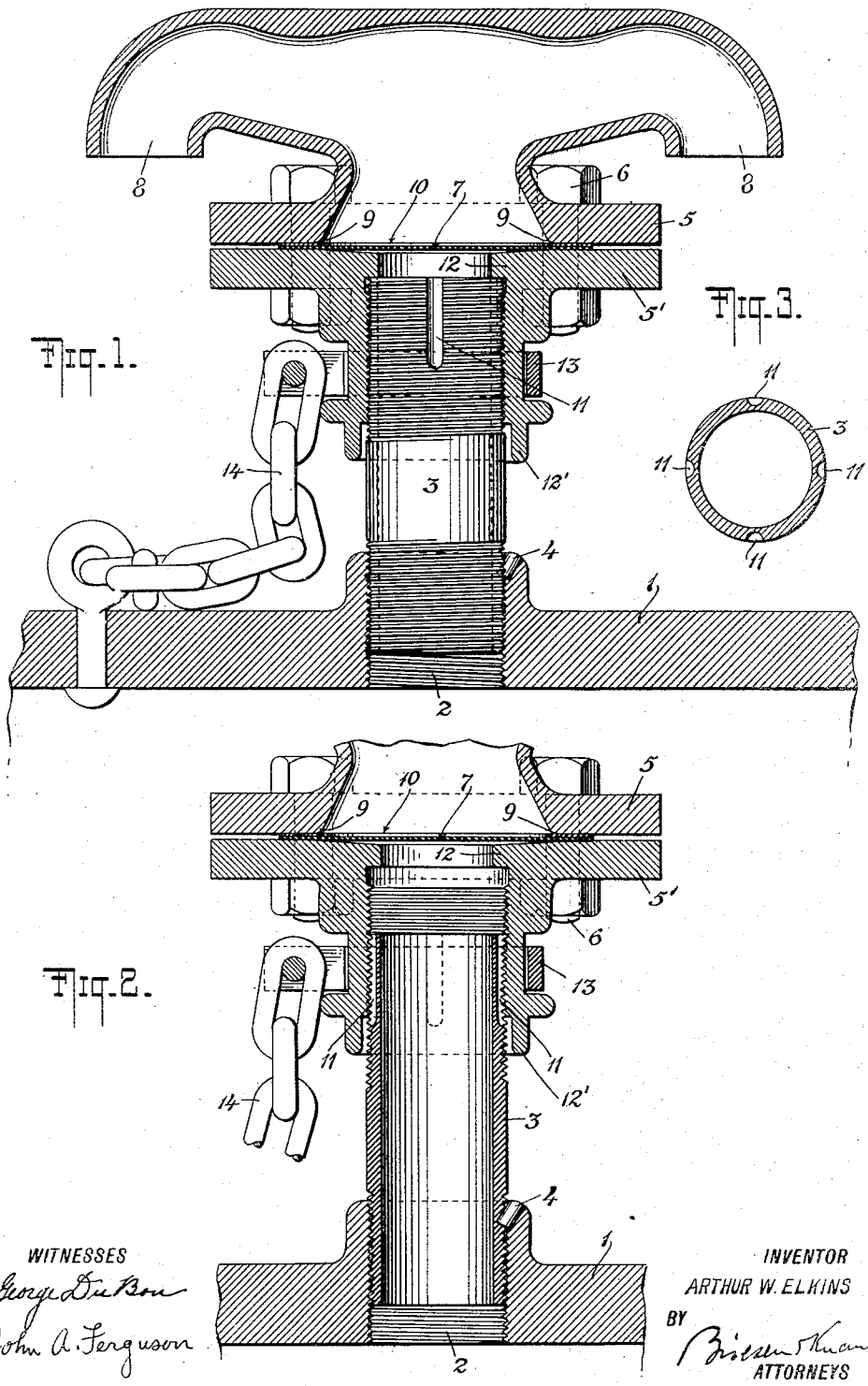


Fig. 1.

Fig. 3.

Fig. 2.

WITNESSES

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TANK-CAR VENT.

1,205,443. Specification of Letters Patent. Patented Nov. 21, 1916.

Application filed June 6, 1913. Serial No. 772,048.

To all whom it may concern:

Be it known that I, ARTHUR W. ELKINS, a subject of the King of Great Britain, and a resident of East Orange, Essex county, New Jersey, have invented certain new and useful Improvements in Tank-Car Vents, of which the following is a specification.

My invention relates to vents for tank cars and similar vessels, especially such vessels as are adapted to contain liquid chemical products, for example, sulfuric acid, and more particularly relates to vents of the frangible lead disk type which are provided with closures adapted to be removed when it is desired to withdraw the liquid contents of the vessel.

An object of my invention is to provide a vent which is so constructed as to allow the escape of gases or vapors under pressure in the vessel or tank when the cap is only partially removed from its closed position.

Another object is to provide such a construction that the escaping matter will issue in such a direction as not to come into contact with the workman removing the cap.

Other objects will be pointed out or will otherwise appear in the following description of the embodiment of my invention which is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical sectional view of a tank car vent embodying the features of my invention, the cap being in closed position, Fig. 2 is a similar view, the cap being in partially removed position and the upper portion of the cap being broken away, and Fig. 3 is a cross-section of the vent nipple showing the pressure escape passages.

In the drawings the reference character 1 indicates a tank car provided in its top with a screw threaded aperture 2 into which is screwed the nipple 3. When properly positioned the nipple is held in position by means of a suitable nut lock such as the locking plug 4. The upper end of the nipple is also screw threaded for the reception of the vent cap, a portion of which is internally screw threaded to coöperate with said nipple screw threads. The cap is preferably composed of upper and lower hollow members 5 and 5′ respectively which are secured together in any suitable manner, as by bolts 6. Between the adjacent faces of these members a frangible lead disk or diaphragm 7 is held. In case an excessive pressure develops in the tank, such pressure acting upon the under face of the disk will force it upwardly and finally rupture it. The vapors then enter into the hollow upper member 5 and escape therefrom in a downward direction through the orifices 8. The peripheral portions of the disk are held immovable between the members 5 and 5′, the extent of the movable central portions thereof being defined by the diameter of the hollow space of the upper member in proximity to the disk. The edge of metal surrounding this space is rounded off, as at 9, so that there is a minimum of cutting effect at said edge 9 when the central portion of the disk is forced upwardly. Moreover, a washer 10 of asbestos or similar materal is placed above the immovable periphery of the disk, between said portion and the clamping surface of the upper member, to cushion the disk and thus also prevent undue cutting thereof by the edge 9.

The nipple 3 is provided with one or more longitudinal grooves 11 which cut across the upper screw threads and extend from the upper end of the nipple to a point part way across the screw threaded portion. The cap member 5′ is provided with an internal flange 12 the under surface of which is adapted to fit tightly against the upper end of the nipple when in closed position. In such position the fluid under pressure in the tank and in the nipple below the lead diaphragm is prevented from entrance into the grooves 11. As soon as the cap has been unscrewed slightly, however, the pressure is admitted, as will be readily understood, to said grooves. When the cap has been further unscrewed and has reached substantially the position shown in Fig. 2 the lower ends of the grooves are placed in communication with the atmosphere. The gases or vapors, and the particles of liquid which are apt to be carried with them, are thus allowed to escape from the tank through the grooves before the cap is fully removed. The pressure is released in a generally downward direction so that the vapors do not come into contact with the person removing the cap. It will be readily seen that the construction prevents injury of any kind such as that which would be caused by the discharge of vapors of, for example, sulfuric acid, carrying with them particles of liquid acid, upon

the person of the workman. The downward discharge is enhanced by the provision of a depending flange 12′, the inner diameter of which is slightly greater than the diameter of the nipple 3.

A collar 13 working in an annular slot in the cap and a chain 14 attached at its ends to the collar and to the tank may be provided for the purpose of preventing the loss of the cap when removed from the nipple.

It will, of course, be understood that various modifications may be made without departing from the spirit and scope of my invention as defined in the appended claims.

I claim:

1. The combination of a tank, a nipple in communication therewith, a closing cap for said nipple, said cap and said nipple being provided with coöperating screw threads whereby said two members are joined together, one of said members being provided with a passage extending longitudinally from one end thereof to said screw threaded joint at a point intermediate the ends of said joint.

2. In combination, a nipple and a cap screw threaded thereon, said cap being provided with a portion adapted to contact with the end of said nipple when in closed position, said nipple being provided with an exterior groove deeper than the depth of the screw threads on said nipple and extending from the end of said nipple to a point intermediate the ends of the screw threaded portion thereof.

3. In combination, a nipple and a cap screw threaded thereon, said cap comprising upper and lower hollow members secured together, the hollow space of said upper member being in communication with the atmosphere and said lower member being provided with an annular flange adapted to contact with the end of said nipple when in closed position, said nipple being provided with an exterior groove deeper than the depth of the screw threads on said nipple and extending from the end of said nipple to a point intermediate of the ends of the screw threaded portion thereof.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ARTHUR W. ELKINS.

Witnesses:
T. LYNTON BRIGGS,
JOHN A. FERGUSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."