A. B. CARLL.

DOME COVER FOR TANK CARS.

APPLICATION FILED JULY 7, 1920.

1,432,591. Patented Oct. 17, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

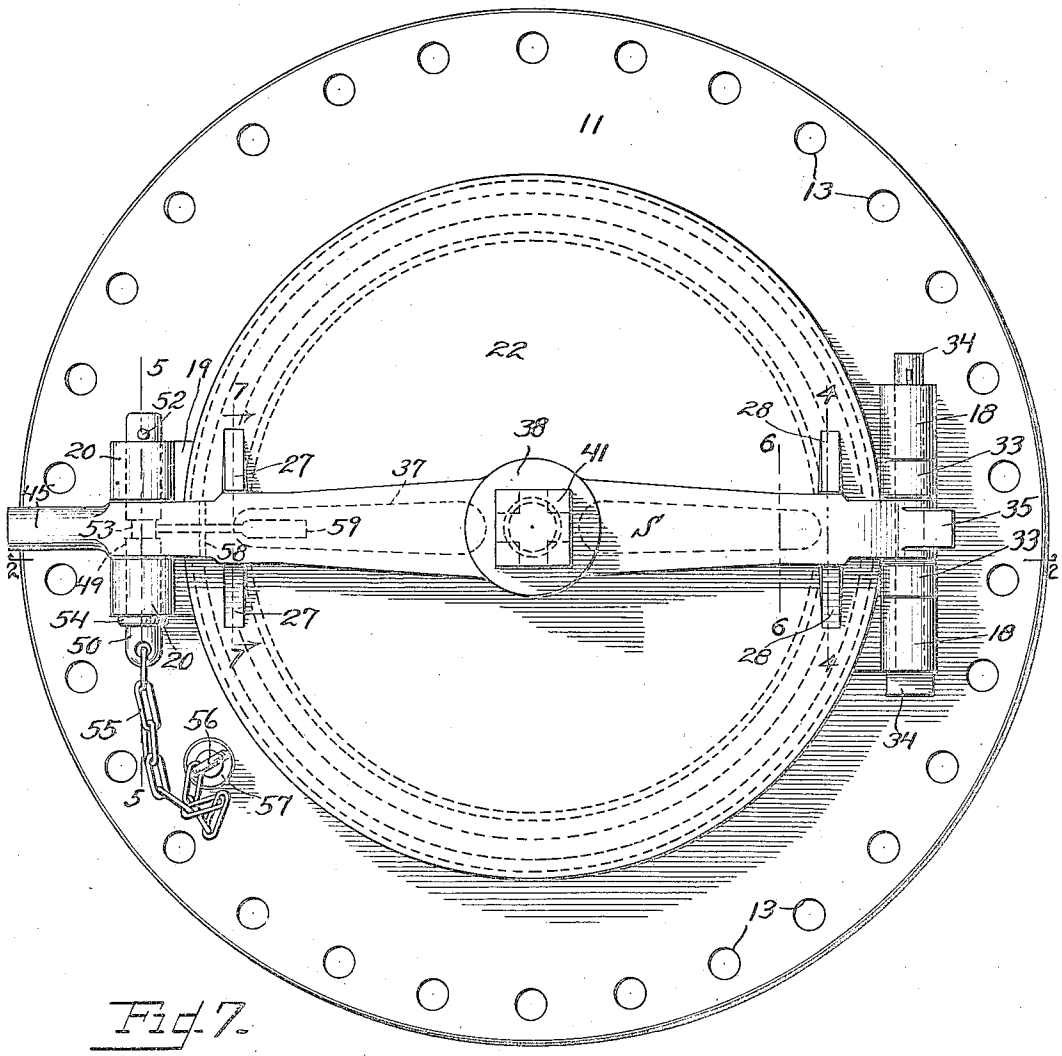
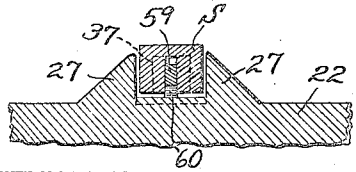


Fig. 7.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 2.

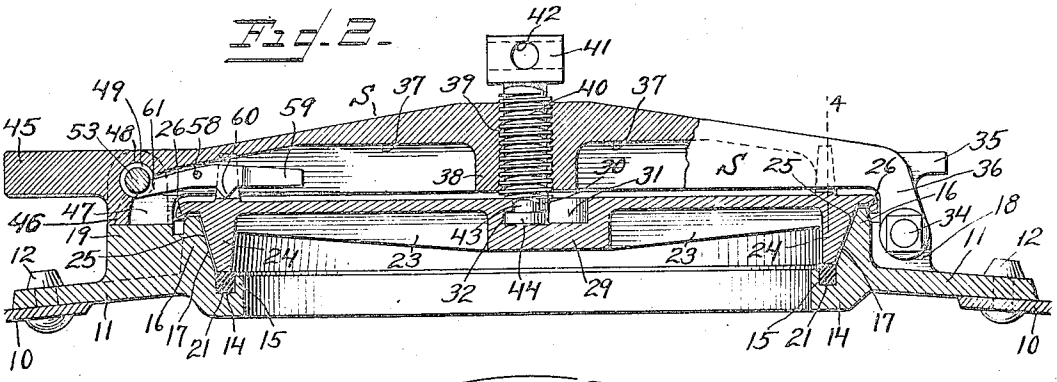


Fig. 3.

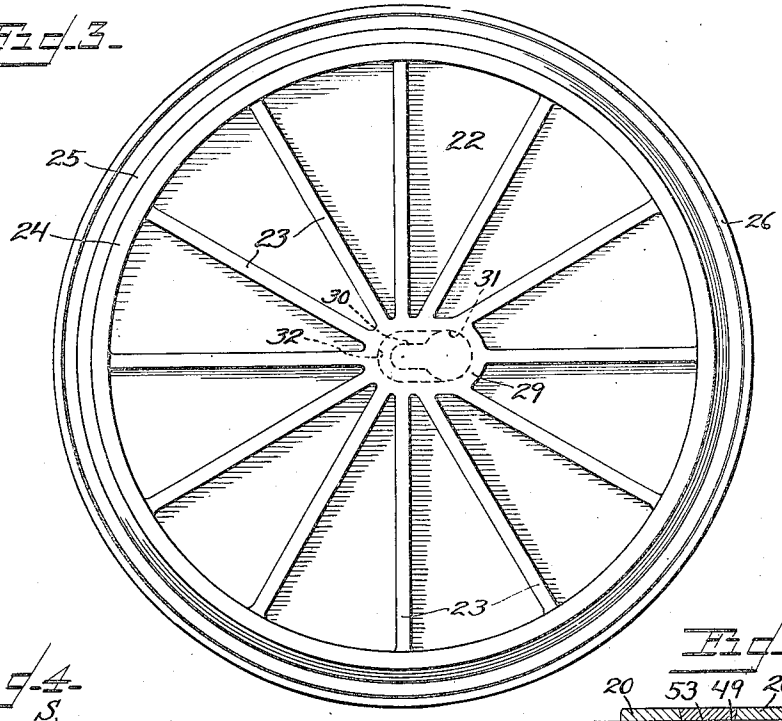


Fig. 4.

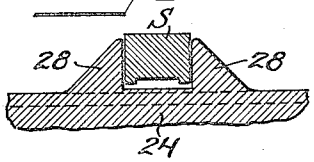


Fig. 6.

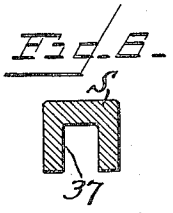
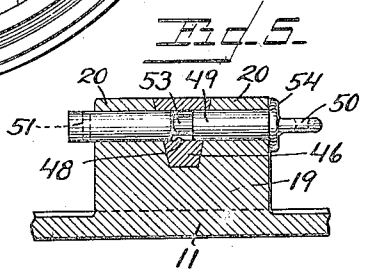


Fig. 5.



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UNITED STATES PATENT OFFICE.

ADDISON B. CARLL, OF NEW YORK, N. Y.

DOME COVER FOR TANK CARS.

Application filed July 7, 1920. Serial No. 394,434.

To all whom it may concern:

Be it known that I, ADDISON B. CARLL, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Dome Cover for Tank Cars, of which the following is a specification.

The present invention relates to dome covers for railway cars used in transporting oil. In tank cars as at present constructed, screw covers are employed which are very unsatisfactory because, in the first place, when they are taken off and hung alongside of the dome they require a considerable amount of strength to get them back into place, and hence are too often left open when they should be closed; and in the second place, the present dome covers, if unscrewed when there is a considerable pressure in the tank, will allow blowing of the oil in the air with consequent danger of fire.

The principal objects of the invention are to provide a dome cover for a tank car which will be tight, which is easily opened and closed, and which will automatically vent and relieve any gas pressure which may be inside of the car before it can be opened.

A further object of the invention is to provide a cover which is capable of being closed without being tightened on its seat so as to provide a vent for the gases within the tank generated when the car is being pumped out.

A further object is to provide a dome cover which will close itself by the jar of putting the car into motion should it be left open by mistake.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing forming part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing in the drawing, but may be changed and modified so long as such changes and modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:—

Fig. 1 is a top plan view of the improved dome cover shown seated on the flange of the tank car.

Fig. 2 is a vertical cross section on the line 2—2 of Fig. 1.

Fig. 3 is a bottom plan view of the cover proper.

Fig. 4 is a vertical section on the line 4—4 of Figs. 1 and 2.

Fig. 5 is a vertical section on the line 5—5 of Fig. 1.

Fig. 6 is a cross section through the spider on the line 6—6 of Fig. 1.

Fig. 7 is a cross section on line 7—7 of Fig. 1.

The top of the dome of the tank car is indicated by the numeral 10 in Fig. 2. This dome top has an opening as indicated, and a flange 11 is secured by rivets 12 passing through rivet holes 13 (Fig. 1) upon the top of the dome. The flange 11 is annular, as seen in Fig. 1, and has a circular central opening therethrough. Bordering this opening is a depending flange 14 which provides the necessary stiffness. Within the flange 14 an annular groove 15 is provided which preferably is retangular in cross section.

The flange 11 has an upstanding annular shoulder 16 having a beveled cover-seating face 17. The flange 11 also has a pair of lugs 18 forming parts of a hinge for the cover, as will be described. The lugs 18 each have a transverse bore for receiving a pintle. At a point diametrically opposite the lugs 18 a block 19 is located, which block terminates in a pair of ears 20 designed to receive between them the free end of the spider. The parts so far described are joined to and preferably integral with the flange 11.

The cover which is designated generally by the numeral 22 is substantially flat on its upper face and on its lower face is provided with a number of radial ribs 23. The purpose of the radial ribs is to give the necessary strength to resist the clamping pressure of the cover-seating means to be described. These ribs 23 branch out like the spokes of a wheel from a central hub 29 where the cover is of its greatest thickness. The cover has an annular flange 24, which flange has a beveled outer face 25 designed to seat upon the beveled inner face 17 of the shoulder 16. These two faces should be machined to fit precisely so that if no gasket is used, a substantially gas-tight joint between the cover and flange will be had. It is very desirable, however, to use a gasket which may be asbestos, graphite or lead. In the drawing,

a gasket 21 is shown seated within the groove 15. The lower edge of flange 24 rests on this gasket when the cover is in place. The cover not being screw-threaded, as are ordinary dome covers, is driven by the clamping means directly down against the upper face of the gasket and is lifted directly upward from the gasket. Thus no abrasion or wearing of the gasket takes place, with the result that the gasket has a long life and always makes a gas-tight joint.

The outer edge of the cover 22 fits over the upper edge of the shoulder 16 and is turned down as indicated at 26 so as to prevent dirt, cinders or the like from lodging in the joint. The upper face of the cover has a pair of upstanding lugs 27 properly spaced to receive between them the spider S. Another pair of lugs 28 is provided at a diametrically opposite point on the cover and also receives between them the spider. These two pairs of lugs, which are in the nature of guides, have a close fit with the spider and prevent any turning of the cover with respect to the spider. The central hub 29 of the cover has a locking connection with a screw 40. An elongated slot 32 is provided in the hub 29, which slot has the shape in plan of a flattened ellipse. A round slot 31 opens into one side of the elongated slot 32, and joining with the round slot 31 is a narrower slot 30. The recess so formed is adapted to receive the circular foot 44 of the screw 40. The foot 44 may freely pass in or out of the slot 31. A stem 43 joins the main body of the screw with the foot 44 and is itself of sufficient diameter to be received within the slot 30. Fig. 2 shows the usual position of the parts where the lower end of the screw 40 is locked with the cover. If it is desired to detach the screw from the cover, it is only necessary to raise the cover and then turn the screw all the way down and slide the cover in the direction of the free end and effect disengagement of the foot 44 from the slot 32.

The spider, which is designated generally by S, has a relatively thick rounded central part 38 provided with a vertical screw-threaded bore 39 for receiving the screw 40. On either side of the central part 38 of the spider it is hollowed out or cored as indicated at 37, this coring saving metal and thus making the spider lighter to handle. The head 41 of the screw is square and has a transverse bore 42 therein for receiving a wrench or bar whereby the screw may be turned.

One end of the spider S is hinged upon the flange. At that end the spider has a downward bend 36 terminating in a T-head 33. The T 33 fits between the lugs 18 and has a bore which alines with the bores in the lugs so that a pintle 34 may pivotally connect the T with the lugs. The end 36 of the spider has a leg 35 with its squared-off end adapted to rest upon the upper face of the flange 11 when the cover is raised into wide-open position.

The free end of the spider has an extension 45 which serves as a handle. At the same end of the spider a projection 46 is provided with a squared-off lower end adapted to rest upon the upper flat face of block 19 between ears 20. The ears 20 have alined bores for receiving a locking pin 49. A perforation 48 is provided at a proper point on the spider S so that when the spider is seated, the pin 49 may be passed through the ears 20 and through the spider so that the spider may not be displaced. The pin 49 has an eye 50 at one end and a bore 51 at the opposite end. The bore 51 may have a seal passed through it, or instead of a seal, some other securing element 52 may be used, to hold the pin in place. The pin 49 has a groove 53 so located that when the pin is in position the grooved part thereof will be within the hole 48 in the spider. A skirt 54 is provided on the pin to cooperate with the fastening element to prevent sliding of the pin within the ears 20. The eye 50 of the pin is joined with a chain 55 also linked with an eye bolt 56 secured within a hub 57 provided on the flange 11; thus it is impossible for the pin to become lost.

Within the coring on the under side of the spider adjacent the handle end 45, a dog 59 is mounted, the cross pin 58 providing a pivot for this dog. The dog has a tooth 60 which is normally pressed downwardly by the weight of the dog upon that portion of the upper face of the cover which is located between the lugs 27. It will be understood that the dog 59 is properly weighted to maintain the tooth 60 pressing against the cover. The opposite end 61 of the dog 59 is properly shaped to engage with the groove 53 of the pin 49 to prevent withdrawal of the pin until after the cover has moved the dog out of engagement with said pin. To permit swinging of the pin-engaging end of the dog, the cored part 37 has a continuation 47 extended down to the end of the projection 46.

The screw 40 raises or lowers the cover off its seat on the flange approximately a quarter of an inch so that only a single turn of the screw is necessary to seat or unseat the cover. When the cover is unseated, a vent will be provided for the gases within the tank car; thus relieving the pressure. When the cover is forced up against the under side of the spider, the dog will be moved out of engagement with the pin 49, which may then be removed. Until the cover is raised to its full extent, it will not be possible to withdraw the pin 49 and swing the spider and cover back out of the way. As long as there is internal pres-

sure on the cover, the pin cannot be pulled. The cover, when laid down upon the opening but not screwed tight, furnishes the vent which is desirable when unloading the tank car and provides a safety valve in case of an explosion of gases inside of an empty car.

The cover stands upright when open and is easily closed so that there is no temptation to neglect closing the tank. If, however, it should be left open and resting upon the leg 35, the starting of the car will overbalance the heavy cover and it will slam shut.

The more important features of the present invention are: First, that it is quick-acting, but one turn of the screw 40 opening or closing the cover; second, it is self-venting, providing a safety valve for the car and making it impossible to open the car until the gases have been discharged; third, it is self-closing, it being impossible to handle the car in railroad traffic without the cover swinging shut; and fourth, the cover is self-sealing, the beveled faces 17 and 25 in conjunction with the gasket 21 insuring a tight joint even if the screw is not turned down.

It will be observed that the ends of the spider are turned down on each side of the cover, thus preventing any movement of the cover longitudinally of the spider. The lugs 28 of the cover prevent rotary movement. Thus, only one movement is given to the cover, and that is an in-and-out movement caused by the screw, on which screw the cover is slidably mounted.

What is claimed is:

1. In a dome cover for tank cars, the combination of a flange secured to the top of the dome, said flange having a central circular opening with a raised annular shoulder provided with a beveled inner face, an annular recess bordering the shoulder at the base, a gasket seated within the recess, a cover having a depending annular flange on its under side with a beveled outer face fitting within and against the beveled inner face of the shoulder and with its lower edge resting on the gasket, an overhanging edge on the cover fitting about the outside of the shoulder, and means whereby the cover may be brought into position and tightened upon the gasket.

2. In a dome cover for tank cars, the combination of a flange secured to the top of the dome, said flange having a central circular opening with a raised annular shoulder provided with a beveled inner face, a flange bordering the said opening at the base and having in its upper face an annular recess at the base of the shoulder and offset from said beveled face, a gasket seated within the recess, a cover having a depending annular flange on its under side with a beveled outer face fitting within and against the beveled inner face of the shoulder, the two beveled faces being machined to make a gas-tight joint, the lower edge of the flange on the cover bearing against said gasket, an overhanging edge on the cover fitting about the outside of the shoulder, a spider hinged on the first mentioned flange to swing outwardly and extending across the cover, and means between the cover and the spider whereby the cover may be brought into position and the flange tightened upon the gasket or loosened to provide a vent for the gases within the tank.

3. In a dome cover for tank cars, the combination of a flange having an annular shoulder bordering a central opening, a beveled face on the inside of said shoulder, a gasket seated in the flange at the base of the beveled face, a spider hinged upon said flange to swing outwardly and reaching across the opening, coacting means on the flange and on the spider for locking the spider near the free end thereof, a cover fitting the opening in the flange and connected with the under side of the spider, and means whereby said cover may be held tight against the spider and swung with it or may be forced against the beveled face of the flange after the spider has been locked.

4. In a dome cover for tank cars, the combination with a flange secured to the dome and having an opening, a spider hinged upon the flange to swing outwardly and extending across the opening in the flange, a cover mounted on the under side of the spider, means whereby the cover may be held to the spider and swung with it, means for locking the spider at the end remote from its hinged end, and means to prevent disconnection or withdrawal of the spider locking means until said cover has been forced into relation with the spider.

5. In a dome cover for tank cars, the combination with a flange secured to the dome and having an opening, a spider hinged upon the flange to swing outwardly and extending across the opening in the flange, a cover mounted on the under side of the spider, means whereby the cover may be held against the spider and swung with it, a pin engaging with the flange and spider for locking the end of the spider remote from the hinge, and a dog pivotally mounted on the under side of the spider for engagement with the spider locking pin to prevent withdrawal of the same until the cover has been forced tight against the spider.

6. In a dome cover for tank cars, the combination of a flange having a central opening, a spider hinged upon the flange to swing outwardly and reaching across said opening, coacting means on the flange and on the free end of the spider for locking the spider, a cover fitting the opening in the flange, and means connecting the spider and cover whereby said cover may be raised

against the underside of the spider and release the locking means so as to permit the spider to be swung open and the cover with it, said connecting means also providing for forcing the cover upon its seat when the spider is closed and locked.

7. In a dome cover for tank cars, the combination of a flange, a cover, and a hinged spider above the cover, means connecting the cover and spider for raising and lowering the cover, and a locking pin for the free end of the spider having a recess, a dog pivoted within the spider, one end of the dog resting normally in the recess of the spider so that the dog will release the pin when the cover has been raised against the spider.

8. In a dome cover for tank cars, the combination of a flange. a cover, and a hinged spider, a locking block located on the flange opposite the hinge of the spider, said block having a recess with sloping side walls, the free end of the spider being shaped to fit said walls, and a locking pin passed through the block and the spider for holding the spider in place.

9. In a dome cover for tank cars, the combination with a flange secured to the dome and having an opening, a spider hinged upon the flange to swing outwardly and extending across said opening, a cover mounted upon the under side of the spider, a screw connection between the cover and the spider to raise or lower the cover, and means for locking the spider, said locking means being releasable only when the cover is raised to its full extent.

10. In a dome cover for tank cars, the combination with a flange secured to the top of the dome, said flange having an opening with a raised annular shoulder provided with a beveled inner face, a spider hinged to said flange to swing outwardly and reach across the opening, and a cover fitting the opening of the flange and connected with the under side of the spider, the hinged end of the spider being provided at one side of the hinge with a leg having a squared-off end which is adapted to rest upon the upper face of the flange when the cover is raised into wide-open position, whereby the cover will automatically close by the jar of putting the car into motion should the cover be left open by mistake.

11. In a dome cover for tank cars, the combination with a flange secured upon the top of the dome, said flange having an opening provided with a cover seat, a spider hinged to said flange to swing outwardly and extending across said opening, the spider having a bend at the hinged end and a projection at the free end whereby the main part of the spider is spaced from the flange, a cover fitting said seat and received within the space between the bend and projection of the spider whereby sliding movement of the cover longitudinally of the spider is prevented when the cover is in its lowered position, said cover having lugs upstanding from the outer face and embracing the side edges of the spider preventing rotation of the cover relative to the spider, and means for holding the cover tightly against the underside of the spider, or for forcing it outwardly from the spider, said means also allowing the cover to be entirely disengaged from the spider when in its raised position.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature.

ADDISON B. CARLL.