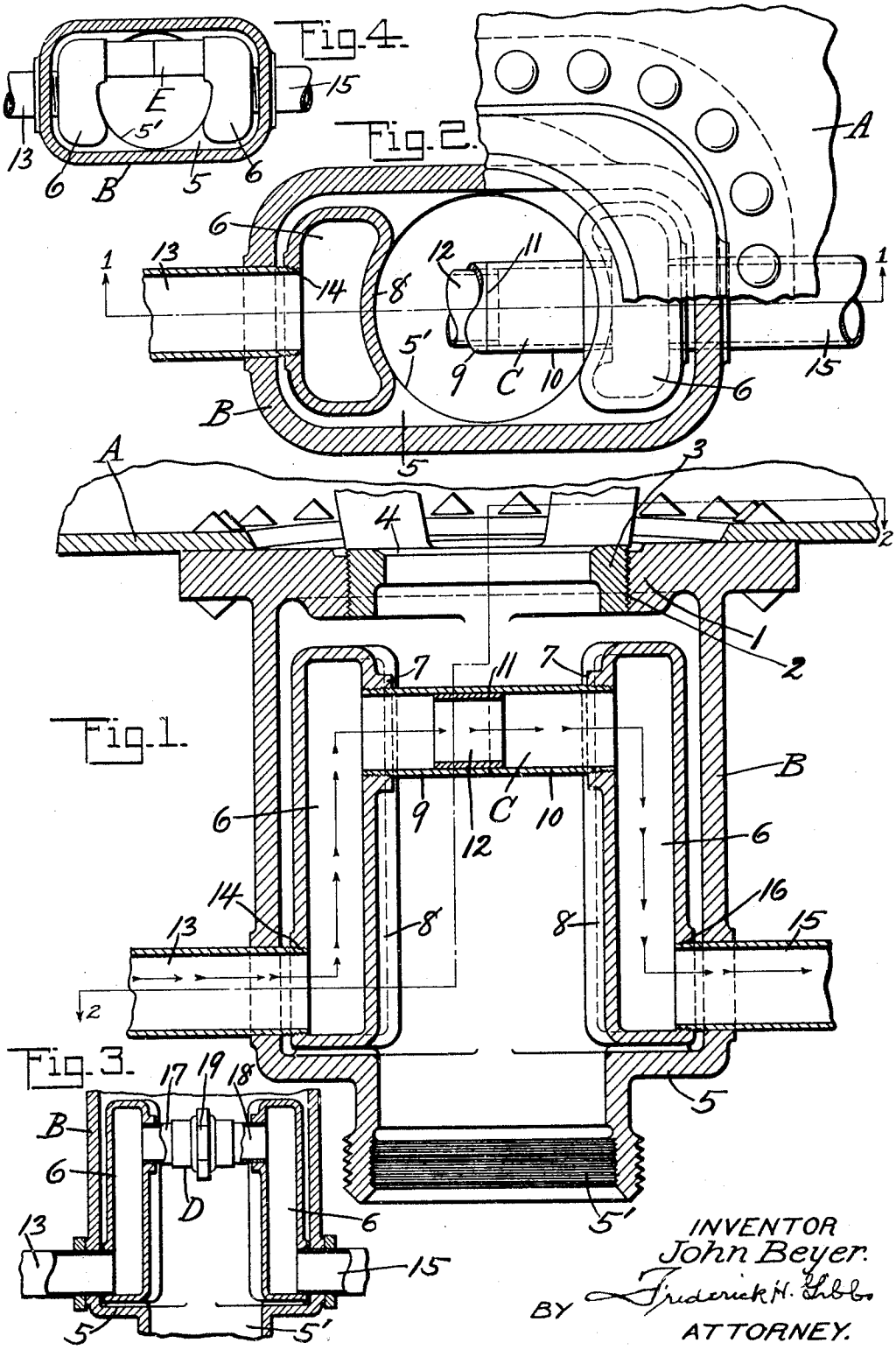
Sept. 10, 1929. J. BEYER 1,727,692

DISCHARGE OUTLET FOR TANKS

Filed May 7, 1927



Patented Sept. 10, 1929. 1,727,692

UNITED STATES PATENT OFFICE.

JOHN BEYER, OF BAYONNE, NEW JERSEY, ASSIGNOR TO AMERICAN CAR AND FOUNDRY COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

DISCHARGE OUTLET FOR TANKS.

Application filed May 7, 1927. Serial No. 189,603.

Reference is had to the accompanying drawings which illustrate the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof within the scope of the claims will occur to persons skilled in the art.

In said drawings:

Figure 1 is a sectional view of the improved nozzle, the same being applied to a tank, the view being taken on the line 1—1 of Fig. 2;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1;

Fig. 3 is a view partly in section of a modified form of the invention, and

Fig. 4 is a top plan view of the header construction showing a modified form of header connection.

This invention relates to a discharge nozzle for a storage receptacle or tank car wherein either the receptacle or tank is adapted to contain such lading as tar, lard, heavy road oils or other like commodities, the characteristics of which are such that they solidify or congeal in the tank. This invention is also applicable to a tank car or the like adapted to contain gasoline or other like commodity.

When the receptacle is loaded with material which tends to solidify or congeal, it is customary to apply heat thereto to improve the fluidity of the material when it is desired to discharge the same from the tank, in order that such commodities may readily flow through the nozzle.

This invention further and more specifically relates to heating means for the discharge nozzle, to the end that rupture or fracture thereof may be obviated or the danger of such breakage minimized, it having been found in practice that frequently the discharge nozzle will become filled with water, often to the level of the discharge valve of the tank, the water remaining in the nozzle and there becoming frozen with a resultant rupture or breakage of the nozzle.

It is, therefore, one object of the present invention to provide a discharge nozzle for the exterior of a tank or the like having means for heating the same.

Another object of the invention is to provide a means whereby the discharge nozzle of a tank or the like will be heated with a resultant heating of the tank itself adjacent the outlet.

As before-mentioned, one disadvantage of the discharge nozzles in present day usage is that water frequently freezes therein resulting in breakage of the nozzle necessitating a replacing of the complete nozzle. I am aware that it is old to provide heated discharge nozzles, and I am also aware that it is old to provide a jacketed nozzle through which a heat exchange medium is circulated and these have proven satisfactory for the purpose of heating the nozzle. It has been found that it is desirable to provide a discharge nozzle with some means which will serve as a resisting element to take up the expansion of a congealing medium, such means being collapsible under pressure less than that required to rupture the discharge nozzle.

Another object of the present invention, therefore, is to provide a discharge nozzle with an element positioned therein which is collapsible under pressures less than that required to rupture the discharge nozzle, said element serving to resist to a great extent the expansion of a congealing medium.

Many other objects and advantages of this invention will be apparent from the following description, taken in conjunction with the accompanying drawings, in which A designates a portion of a tank, said tank having an opening therein for discharging the contents of the tank, this construction being well known in the art at the present time. The opening is adapted to connect with the discharge nozzle indicated generally as a casting B which is

secured to the tank in any suitable or desired manner.

The nozzle B is preferably substantially rectangular in form or at least is of greater cross-sectional length than width for the purposes hereinafter described, and is provided with a top portion 1 having a threaded opening 2 therein in which is secured an annulus 3 having a seat 4 for a discharge valve. The bottom 5 of the nozzle B is provided with an outlet 5′ which is normally closed by a cap (not shown). As clearly shown in Fig. 1, the inner wall of the outlet 5′ is substantially in line with the lower portion of the inner wall of the annulus 3 and this provides a construction whereby heating elements such as headers may be positioned within the nozzle B adjacent the ends thereof and in such a manner that a substantially uninterrupted passage will be provided from the opening in the tank to the discharge outlet 5′ thereof.

The means for heating this nozzle B are clearly shown and comprise closed headers 6 oppositely and vertically arranged in the nozzle, the headers being connected together adjacent their upper ends by suitable means such as the conduit C shown in Figs. 1 and 2, said conduit having threaded engagement at its ends with an internally threaded boss 7 formed adjacent the upper end of each header.

The headers are preferably of the form illustrated in section in Fig. 2 and are formed of material having less strength to resist strains and pressure exerted thereagainst than the material of the nozzle itself, and said headers each are provided with a concave inner face 8 which, when the headers are positioned within the nozzle B, are alined with the opening from the tank and with the discharge outlet; thus providing a free passage for the commodity in the tank which passage is interrupted only by the conduit C which latter, of course, is also a heating element.

The conduit C is preferably formed of sections 9 and 10 arranged in abutting relation end to end, the meeting ends thereof being welded at the joint 11. Positioned within the conduit C and overlapping the joint 11 is a thimble 12. An inlet pipe 13 is connected with one of the headers 6 at the lower end thereof, the pipe 13 passing through an opening formed in the nozzle B and being threadedly engaged with said header 6, as shown at 14. Secured to the other header 6 and diametrically opposed to the pipe 13 is an outlet pipe 15 which extends through the nozzle B as shown and is threadedly engaged with the lower end of said header 6 as shown at 16.

In the assembly of the device shown in Figs. 1 and 2, the thimble 12 is secured within the unthreaded end of the section 9, with the end of said thimble extending beyond the section. The section 9 is then threadedly engaged with the header 6. The header 6, with its connected section 9, is inserted into the nozzle B through the outlet 5′. The section 10 of the conduit C is then engaged with the other headers 6 and the latter, with its connected section 10, inserted into the nozzle B and the sections 9 and 10 are then placed in abutting relation at the free ends thereof, the free end of section 10 telescopically engaging the extended end of the thimble 12. The abutting ends of sections 9 and 10 are then connected, for example, by welding, as shown at 11.

The headers 6 are each provided with an opening at the lower end thereof, which openings are diametrically opposed when the headers are in the assembled position illustrated in Fig. 1. The inlet and outlet pipes 13 and 15 respectively are secured within the openings in the lower ends of said headers and the device is then completely assembled, it being apparent from an inspection of the drawings that the headers are so arranged as to be positioned outside or adjacent to a direct passage from the opening in the bottom of the tank to the discharge outlet.

Fig. 3 discloses a modification of the invention, more specifically, a modified form of header connecting means. As shown in this figure, the nozzle B, headers 6 and inlet and outlet conduit pipes 13 and 15 are identical with those shown in Figs. 1 and 2. The headers 6 of this figure are connected by a conduit D composed of the sections 17 and 18 which are respectively threadedly engaged with the headers 6 and said sections are connected together by means of a union 19.

It is desirable that the nozzle be so constructed that as uninterrupted a passage as is possible be provided between the tank and the discharge outlet of the nozzle, and to this end, as shown in Fig. 4, the headers 6 may be connected by a conduit E which is secured to each header 6 adjacent one side thereof and near the upper ends. The conduit E may be of the type shown in Fig. 1 or Fig. 3, as desired. With this construction, it is apparent that the commodity in the tank will flow therefrom and through the nozzle with very little interruption during its passage, the conduit E being positioned off center, or to be more exact adjacent one side of the nozzle B, thereby providing a larger uninterrupted area for the passage of the commodity from the tank to the nozzle. The conduit E has been shown in this figure as substantially circular, but it is to be understood that this is merely by way of example, the drawings being for illustrative purposes only and that if desired, the conduit E may be made substantially rectangular with the narrow side uppermost, whereby a still greater area might be provided for the uninterrupted discharge of the commodity from the tank through the nozzle. This also applies to the conduit C shown in Fig. 1.

In use, a heating medium, such as steam,

is passed from the pipe 13 through the headers 6 and the connecting conduit and then out through the outlet 15 from whence the heating medium may be conducted into and through suitable coils commonly placed in the bottom of the tank. It will be obvious that in addition to heating the nozzle B, the lower part of the tank adjacent the nozzle B will also be heated, thus aiding in maintaining the fluidity of the commodity in the tank, at least that part of it adjacent the nozzle.

From the above description, it will be apparent that the discharge nozzle has been provided with an element positioned therein which will serve to resist the expansion of a congealing medium up to a certain degree whereupon the element will collapse, and the element is so formed that its collapse occurs at a degree of expansion much less than that required to rupture the nozzle itself. Frequently, the congealing medium will not occupy the entire interior of the nozzle, and when it congeals, instead of being restrained against an upward expansion, the element in the nozzle will permit and in fact, force the medium to expand upwardly rather than in a horizontal direction against the element, thus preventing a total collapse of the element and also preventing a rupture of the nozzle.

What is claimed is:

1. In a tank having a discharge nozzle, means for heating the same comprising connected heating elements positioned in said nozzle.

2. In a tank having a discharge nozzle, means for heating the same comprising oppositely arranged hollow heating elements positioned in said nozzle, and a conduit connecting said heating elements to permit a heating medium to pass from one to the other may be circulated through said elements.

3. In a discharge nozzle for tanks, means for heating the same comprising headers positioned in said nozzle, a conduit connecting said headers, an inlet connected to one of said headers, and an outlet connected to the other header.

4. A discharge nozzle for tanks comprising a casing having a greater longitudinal dimension than a transverse dimension and providing a centrally arranged discharge area, headers positioned in said casing adjacent each end thereof and outside of the central discharge area, a conduit connecting said headers, and steam inlet and outlet means connected with said headers.

5. In a discharge nozzle for tanks, heating elements oppositely arranged therein to provide a central discharge passage, means connecting said elements to permit the circulation of a heating medium therethrough and inlet and outlet pipes connected to said heating elements respectively.

6. In a discharge nozzle for tanks, an elongated hollow casting having an upper inlet opening and a bottom discharge opening substantially in line with said inlet opening, oppositely arranged headers in said casing and each provided with a concave inner face arranged substantially in line with the edge of said openings, a conduit connecting said headers, and inlet and outlet pipes connected to said headers.

7. A discharge nozzle for tanks comprising a hollow casting, and oppositely arranged connected heating elements removably positioned therein.

8. In a tank or the like, discharge means therefor comprising a nozzle having oppositely arranged heating elements removably positioned therein and connecting means for said elements adapted to permit a heating medium to pass from one to the other thereof.

9. A discharge nozzle for tanks comprising a body portion and oppositely arranged heating means therein of less strength than the body portion, said means being collapsible under pressure exerted thereagainst.

10. A discharge nozzle for tanks comprising a hollow body having diametrically opposed inlet and outlet openings, and heating means in said body positioned outside the plane from the edges of the inlet and outlet openings and collapsible under pressure exerted thereagainst by a congealing medium.

11. A discharge nozzle for tanks comprising a hollow body for attachment to the tank adjacent a discharge opening therein and having an inlet and an outlet of less cross-sectional area than said body and a collapsible member positioned in said body outside of the discharge area through the nozzle.

12. A discharge nozzle for tanks comprising a hollow body having an inlet and an outlet of less cross-sectional area than said body and a collapsible member positioned in said body and insertible and withdrawable through said outlet.

13. A discharge nozzle for tanks comprising a hollow body having an enlarged portion intermediate its ends, and oppositely arranged heating means in said enlarged portion collapsible under pressure exerted thereagainst for preventing rupture of said nozzle.

14. A discharge nozzle for tanks comprising a hollow casting for attachment to a tank adjacent a discharge opening and having an enlarged portion intermediate its ends, a heating element rigidly secured within the enlarged portion, and inlet and outlet means formed in the enlarged portion and communicating with the heating element for passing a heating medium through said heating element.

15. A discharge nozzle for tanks comprising a hollow body having an inlet and outlet of less cross-sectional area than said body, a hollow heating element positioned verti-

cally in said body, and means for passing a heating medium through the body and heating element and out of said body.

16. A discharge nozzle for tanks comprising a hollow body for attachment to a tank adjacent a discharge opening therein and having an inlet and outlet of less cross-sectional area than said body, a hollow heating element fixedly positioned vertically in said body, and means for passing a heating medium into and out of said heating element.

In witness whereof I have hereunto set my hand.

JOHN BEYER.