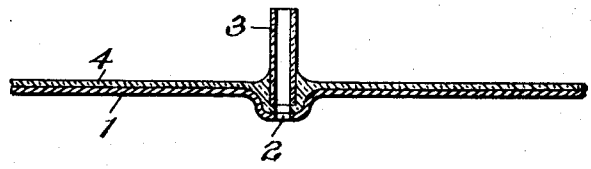
W. A. DUNLAP.

METHOD OF PROVIDING ENAMELED VESSELS WITH SEALED PASSAGEWAYS.

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1,165,951. Patented Dec. 28, 1915.



WITNESSES

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METHOD OF PROVIDING ENAMELED VESSELS WITH SEALED PASSAGEWAYS.

1,165,951. Specification of Letters Patent. Patented Dec. 28, 1915.

Application filed August 26, 1914. Serial No. 858,706.

To all whom it may concern:

Be it known that I, WILLIAM A. DUNLAP, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Methods of Providing Enameled Vessels with Sealed Passageways, of which improvements the following is a specification.

The invention described herein concerns methods of manufacturing metal walled vessels, such for example, as liquid or gas containers, vacuum insulated metal refrigerators, metal thermos bottles, etc., the metal walls of which are all or in part provided with a coating of vitreous enamel. In vessels of this character it is frequently necessary to provide a passageway through an enameled wall thereof for the purpose of filling or discharging the vessel, or, in the case of vacuum insulated vessels, for the purpose of exhausting air from the rarefaction space. And it is further necessary that such passageway be connected to the metal wall by a fluid tight joint. It is toward this particular feature of construction of such articles that my invention is directed, and the object thereof is to provide a method for effecting a practical and durable hermetically-sealed passageway through a vessel wall having a coating of vitreous enamel.

In the practice of my invention I form a suitable orifice in the metal wall of the vessel or container, and place therein a vitreous tube which may be of clear glass. I then form a hermetic seal between the orifice wall and the tube by fusing the tube wall to the vitreous enamel coating of the container. This method, as far as the manufacturing steps are concerned, may be practised in various ways, as will presently be explained.

The accompanying drawing is a sectional view through an orifice in a detached portion of an enameled container wall, showing in longitudinal section the vitreous tube fused to the enamel coating adjacent to the orifice.

The wall 1 may be sheet or cast metal, the orifice 2 preferably being so formed as to have an extended surface area adjacent to the vitreous tube 3 when placed in the orifice, as shown. In the completed vessel the vitreous enamel coating 4 is fused to the tube 3 and to the adjacent surface of the metal wall, thus affording a passageway hermetically sealed to the enameled metal wall.

In the course of manufacture, the tube may be inserted in the orifice either before or after the enamel coating has been applied to the vessel. When inserted before the regular enameling process, the tube may, during the enameling, be held in its proper position by any suitable auxiliary means, or, if desired, the tube may be first attached to the orifice wall by effecting a local heating of the metal adjacent to the orifice, and then placing an annulus of vitreous enamel around the tube, which enamel will of course become fused to the tube and the adjacent metal surface. In whatever manner the tube may be supported, the enameling process is carried on in the usual well known manner, either by the wet or dry process, the outer walls of the tube during such process become hermetically sealed to the wall of the vessel.

When the tube is inserted after the regular enameling of the vessel, its fusion to the vitreous coating may be effected by heating the vessel to the fusion point of the enamel, so that the enamel will spread into contact with and become fused to the tube. However, to obtain a more extended fused area, it is desirable to place an annulus of enamel around the tube to become fused with the previously applied coating and the vitreous tube.

Any desired means may be employed for closing or controlling the opening through the tube 3, it being understood that, as compared to the difficulties involved in attaching, by means of a fluid tight and durable point, a passageway extending through an enameled metal wall to such wall, the matter of providing a closure for a vitreous tube is of little consequence. When the wall through or from which the tube extends forms part of a vacuum insulated vessel, such as illustrated in my copending application Serial No. 858,707, the rarefaction space may be exhausted through the tube, the outer portion of which may then be heated and sealed by the body of plastic glass.

I claim as my invention:

1. The herein described method of providing a metallic vitreous enameled vessel wall with a hermetically sealed passageway, which consists of extending a vitreous tube

from an orifice in such wall, and fusing the tube to the wall at the orifice with a coating of vitreous enamel applied to the wall.

2. The herein described method of providing a metallic vitreous enameled vessel wall with a hermetically sealed passageway, which consists in providing an orifice through such wall, and coating a surface of the metal adjacent to the orifice with vitreous enamel and fusing such enamel to the metal surface and to the outer wall of the tube.

3. The herein described method of providing a metallic vitreous enamel vessel wall with a hermetically sealed passageway, which consists in providing an orifice through such wall, coating the wall with a layer of vitreous enamel, inserting such vitreous tube in the orifice, and fusing the tube to the enamel coating.

In testimony whereof I have hereunto set my hand.

WILLIAM A. DUNLAP.

Witnesses:

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