J. L. FATE.

SEALING MEANS FOR VACUUM JACKETS.

APPLICATION FILED MAY 25, 1906.

988,324. **Patented Apr. 4, 1911.**

Fig. 1

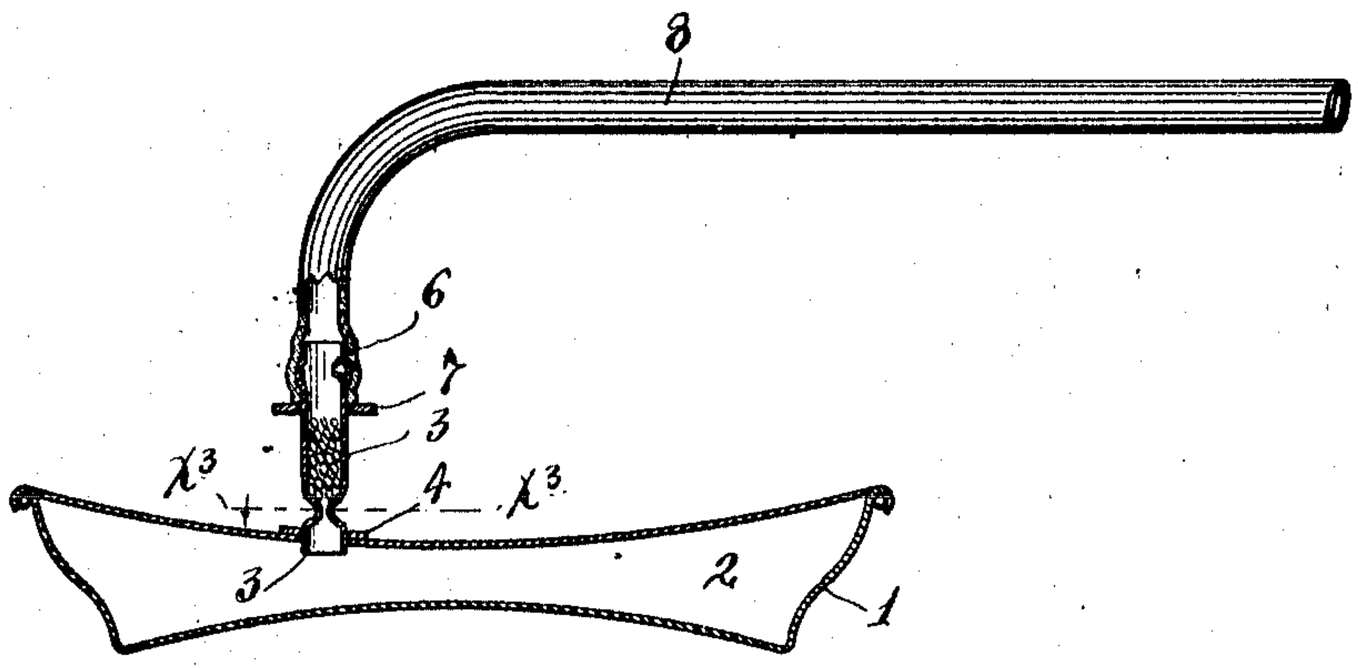
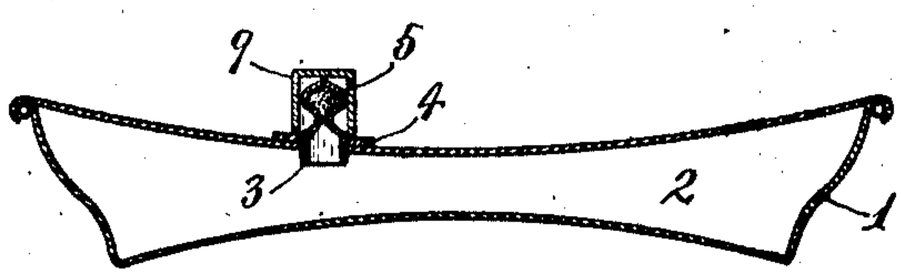


Fig. 3

Fig. 2



Witnesses.
A. H. Opsahl.
Alice J. Swanson.

Inventor.
John L. Fate.
By his Attorneys
Williamson & Merchant

UNITED STATES PATENT OFFICE.

JOHN L. FATE, OF CHICAGO, ILLINOIS, ASSIGNOR TO AMERICAN INSULATING COMPANY, A CORPORATION OF MAINE.

SEALING MEANS FOR VACUUM-JACKETS.

988,324. Specification of Letters Patent. Patented Apr. 4, 1911.

Application filed May 25, 1906. Serial No. 318,639.

To all whom it may concern:

Be it known that I, JOHN L. FATE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Sealing Means for Vacuum-Jackets, of which the following is a specification.

My invention has for its object to provide an effective means for sealing vacuum jackets; and to this end the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claim.

The invention is illustrated in the accompanying drawing wherein like references refer to like parts throughout the several views.

In said drawings, Figure 1 is a view chiefly in vertical section, but partly in elevation, illustrating a vacuum jacket having my improved sealing means applied thereto, with the parts shown as they appear when the air is being exhausted from the vacuum chamber and before the sealing takes place; Fig. 2 is a similar view of the jacket with the sealing means shown as they appear after the air has been exhausted from the vacuum chamber and the sealing effected; and Fig. 3 is a detail in cross section on the line x^3 x^3 of Fig. 1.

In said drawings, the numeral 1 represents a hollow metallic body adapted to afford a vacuum jacket, when the air is exhausted from its interior chamber 2, and this chamber is suitably sealed. The jacket 1 is shown as of a form adapted to serve as a closure to another vacuum jacketed receptacle of larger size, such, for example, as that disclosed in my Patent No. 844,272, of date February 12, 1907. In one wall of said jacket 1 there is seated an exhausting tube or nipple 3, with its lower open end projecting into the chamber 2 of the jacket; and this nipple 3 is shown as provided with a flange 4, which is brazed to the top surface of the jacket wall, thereby rigidly connecting the nipple to the jacket by an air tight joint near its lower end. Directly above this joint, the nipple 3 is contracted so as to bring the inner edges of its walls close together, as best shown in Fig. 3. This can be done by compressing the walls of the nipple by any suitable means at this point which will have the effect of flattening out the nipple at this contracted portion thereof. The nipple is sufficiently contracted at this point to prevent the passage downward therethrough of fusible material 5, which is placed above the same in the nipple 3. This fusible material 5 may be in the form of particles of solder or any other metal of lower fusibility than the material of which the nipple itself is composed, and this solder, or other fusible material, is preferably in the form of small shot-like pellets which will permit the air to be exhausted therethrough. The nipple 3, as shown, is provided with a bead or slight outward enlargement 6 near its upper end and a hose guarding flange 7 located slightly below the bead 6.

The numeral 8 represents a flexible hose connected to an exhausting pump not shown. This pump is of any suitable type adapted to exhaust air from the jacket 1 but is assumed to have a cut-off valve or stop cock intermediate its barrel and the hose 8, so that this valve can be closed to prevent any back flow of air through the hose 8 and nipple 3 to the chamber 2 of the jacket 1 when the pumping is stopped. Assuming that the air has been exhausted from the chamber 2 of the jacket as fully as possible by the action of the pump, the said cut-off valve at the pump is closed, and there will then be a vacuum on both sides of the fusible material 5 in the nipple 3. Then a blow pipe flame or other means of producing heat is applied below the flange 7 to that portion of the nipple 3 containing the fusible material 5, and this is continued until the said material melts and flows downward and accumulates into a solid mass directly above the contracted portion of the nipple 3. The flame of the blow pipe, or other means of applying heat, can easily be so manipulated that the fusible material will only receive heat enough to melt at a point above the contracted portion of the nipple and in descending to the most contracted portion thereof will cool sufficiently to lodge at the said point and not flow on downward through this contracted passage into the chamber 2. After a small portion of the fusible material 5 has thus been lodged at this contracted portion of the nipple, the flame can be freely applied to the higher portion of the nipple containing the greater portion of the fusible material, so as to fully melt the same and let the same accumulate above the now closed passage at the contracted portion of the nip-

ple. Inasmuch as this is all done in this way while the vacuum is maintained on both sides of the fusible material, it is, of course, obvious that there will be no opportunity for the air to flow backward through the nipple into the chamber 2 of the jacket; or otherwise stated, the vacuum obtained under the action of the pump will be hermetically sealed by the accumulation of the fused and solidified sealing metal directly above the contracted portion of the nipple. After this has taken place, the pump hose 8 is removed from the outer end of the nipple 3 and the nipple is then sheared or pinched off sufficiently far above the contracted portion of the nipple and in such a way as to permit the upper end portions of the nipple left remaining with the jacket, to be drawn over the body of solidified sealing metal within the nipple, as shown in Fig. 2 of the drawing. Then a suitable guard 9 is placed over the projecting end of the sealing nipple and brazed fast to the walls of the jacket, as shown in Fig. 2 of the drawings. The vacuum jacket is then ready for use.

By the means above fully described I have, in practice, been able to secure a much more perfect vacuum in these jackets than I was ever able to do by any other means before known to me, for the reason that in all other prior means disclosed in the prior art, so far as known to me, it was possible for the air from the atmosphere to get back into the jacket in the sealing operation.

The method of sealing vacuum jackets herein disclosed, is disclosed and claimed in my U. S. Patent 930,950, of date August 10, 1909.

What I claim is:

A device of the character described comprising the combination of the receptacle from which the air is to be exhausted, of a tube of suitable material mounted upon a wall of the receptacle, the walls of the said tube being compressed at a point near the wall of the receptacle, a bead formed upon said tube near its upper end, a washer mounted upon and secured to said tube below the said bead, there being an opening through said tube to the interior of the receptacle, a quantity of particles of fusible material, in arrangement within the tube to permit the passage of air, which when fused and solidified operates to hermetically seal the said opening, a cup rigidly mounted upon said receptacle inclosing said tube to prevent its displacement.

JOHN L. FATE.

Witnesses:
A. NELSON,
H. L. DODSON.