May 21, 1929. L. R. GOLLADAY 1,714,360

SEALED JOINT

Filed Jan. 19, 1927

Fig. 1.

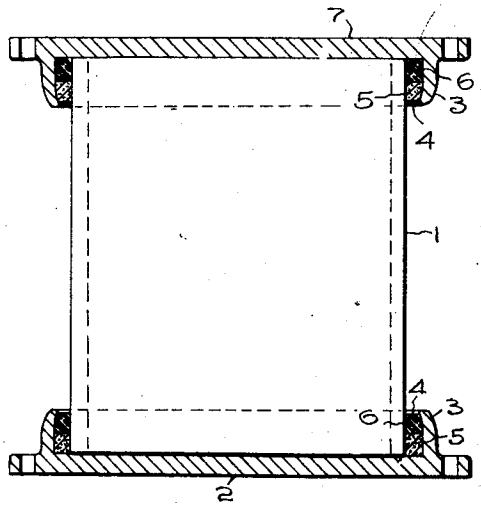


Fig. 2.

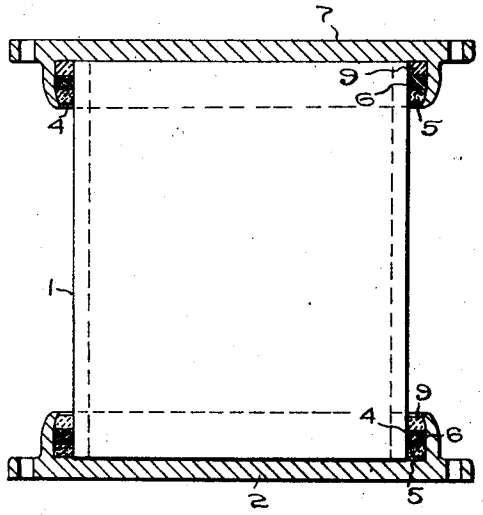
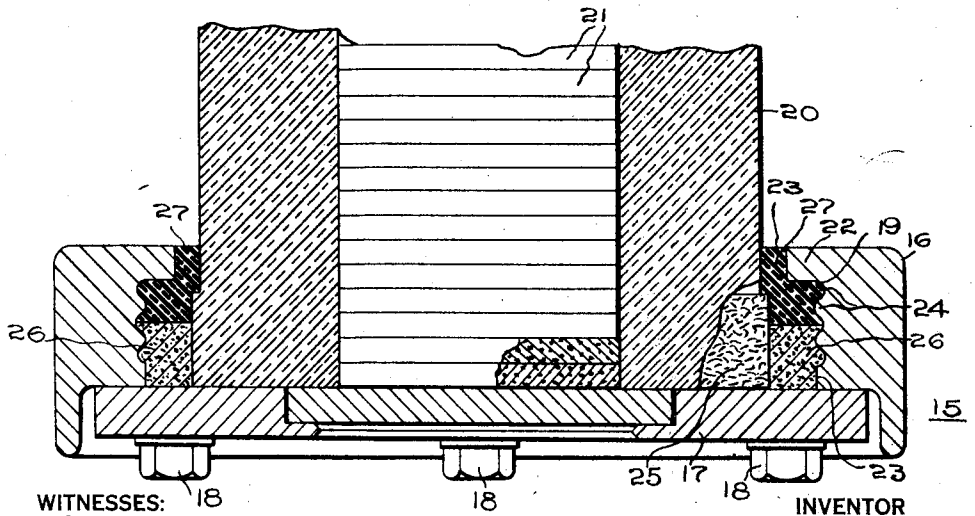


Fig. 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

LAWRENCE R. GOLLADAY, OF EAST PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

SEALED JOINT.

Application filed January 19, 1927. Serial No. 162,192.

My invention relates to a sealed joint, especially to a joint which is impervious to both air and moisture and which will compensate for the thermal expansion and contraction of the members thereof.

More particularly, my invention relates to a joint between a porcelain tubular member and metallic cover member, especially when such members are utilized in the construction of a lightning-arrester container.

The object of my invention is to provide a sealed joint of the type just specified, which is mechanically strong and impervious to both air and moisture, and which will follow the thermal expansion or contraction of the dissimilar, joined members.

In the accompanying drawing:

Fig. 1 is a view, partly in elevation and partly in cross-section, of an embodiment of my invention;

Fig. 2 is a view, partly in elevation and partly in cross-section, of another embodiment of my invention; and

Fig. 3 is a fragmentary sectional view illustrating the utilization of my invention in a particular lightning-arrester construction.

Referring to Fig. 1, a porcelain tubular member 1 is provided with a lower metallic cover member 2. The cover member 2 is provided with an upwardly and inwardly projecting flange portion 3 having an inner diameter which is slightly greater than the outer diameter of the lower portion of the porcelain member, thereby providing an annular pocket 4 between the two parts. Disposed in the lower portion of the annular pocket is a quantity of Portland cement 5 which rigidly secures the metal cover to the porcelain tube. Disposed in the upper portion of the annular pocket, in intimate contact with the Portland cement is as asphaltic material 6 of low melting point, which completely fills the annular pocket.

An upper metallic cover member 7, similar to the cover member just described, is disposed on the top portion of the tubular member in a manner similar to that employed in mounting the lower cover member, except that the relative positions of the asphaltic material 6 and the Portland cement material 5 are inverted, the asphaltic material 6 being put into the pocket first, so that when the device is righted, after filling the annular pocket, the Portland cement 5 is under the asphaltic material 6.

In Fig. 2, I have shown a variation of my invention, wherein the bottom cover member 2 is attached to the lower portion of the tubular member in a manner similar to that hereinbefore described, except that an asphaltic material 9 of high melting point is poured in over the asphaltic material 6 of low melting point, thereby retaining the latter within the pocket when the entire device is inverted, as may happen during construction or transportation.

The top cover member 7 is attached to the upper portion of the tubular member in a manner similar to that hereinbefore described, except that the high-melting point asphaltic material 9 is poured in first, and the low-melting point asphaltic material 6 is interposed between this and the cement 5.

In Fig. 3 is shown an embodiment of my invention, similar to that portrayed in Fig. 1, applied to a lightning-arrester assembly. A two-part metal bottom cover member 15 is provided, comprising an annular casting or flange member 16 and a bottom plate casting 17, held together by means of bolts 18. An annular pocket 19 is provided between the flange portion 16 and the lower portion of the porcelain casing 20. Lightning-arrester disks 21 are supported on the bottom cover member 15.

The top of the annular pocket 19 is partially closed by an inwardly projecting lip portion 22 of the flange 16, leaving only a small opening 23 through which sealing materials are introduced into the pocket. The annular flange portion 16 of the base member 15 has corrugations 24 on its inner bore, and the lower end of the porcelain casing 20 is sanded or knurled, as indicated at 25, thereby providing a means for better holding the sealing materials in place.

Disposed in the lower portion of the annular pocket between the porcelain member and the bottom casting is Portland cement 26, on top of which is disposed a plastic semi-solid asphaltic material 27 as previously described. The two members, to be joined, usually have different coefficients of expansion. The Portland cement provides a good mechanical support, holding the porcelain and metal parts together. In the course of time, however, owing to repeated expansions and contractions, fissures are opened in the cement, and while the mechanical strength is not materially impaired, the cement joint is no longer

tight to air and water. By utilizing the asphaltic material, which is always sufficiently plastic to ooze, or slowly flow into the fissures of the cement and to follow the unequal thermal expansions and contractions, I have provided a resilient seal which is at all times impervious to both air and moisture, and completely closes the space between the members.

While I have shown several applications of my invention, these are by no means the only uses for such a joint, and I desire that the appended claims shall be given the broadest interpretation consistent with their wording and the prior art.

I claim as my invention:

1. A container for outdoor use, comprising a vertical cylindrical insulating member, a metallic end member and a joint therebetween which is impervious to both air and moisture and which will retain its imperviousness in spite of unequal thermal expansions and contractions of the joined parts, said joint being characterized by a lower layer of a cement which makes a mechanically strong joint between the insulating part and the metal part, but which develops, as a result of repeated expansions and contractions, fissures which do not seriously impair the mechanical strength but which render the cement joint pervious to air and water, and a superposed layer of a plastic, semi-solid material resting on said cement and having substantially no mechanical strength of its own but having the property of oozing, or slowly flowing, by gravity, into said fissures and thus preserving the imperviousness of said joint.

2. A container for outdoor use, comprising a vertical cylindrical member, an end member and a joint therebetween which is impervious to both air and moisture and which will retain its imperviousness for a long period of time, said joint being characterized by a lower layer of a cementitious material which makes a mechanically strong joint between the two parts, but which, in time, develops fissures which do not seriously impair the mechanical strength but which render the cementitious joint pervious to air and water, and a superposed layer of a plastic, semi-solid material resting on said cementitious material and having substantially no mechanical strength of its own but having the property of oozing, or slowly flowing, by gravity, into said fissures and thus preserving the imperviousness of said joint.

3. A container for outdoor use, comprising a vertical insulating member having substantially zero coefficient of expansion, a metallic member of a much greater coefficient of expansion and a joint therebetween which is impervious to both air and moisture and which will retain its imperviousness in spite of the relatively great difference in the coefficients of the joined parts, said joint being characterized by a layer of cement material, a layer of plastic semi-solid asphalt material and a second layer of plastic asphalt material having a much higher melting point than said first mentioned layer, said first semi-solid layer interposing said other layers and serving to fill fissures occurring in said cement material.

In testimony whereof, I have hereunto subscribed my name this 10th day of January, 1927.

LAWRENCE R. GOLLADAY