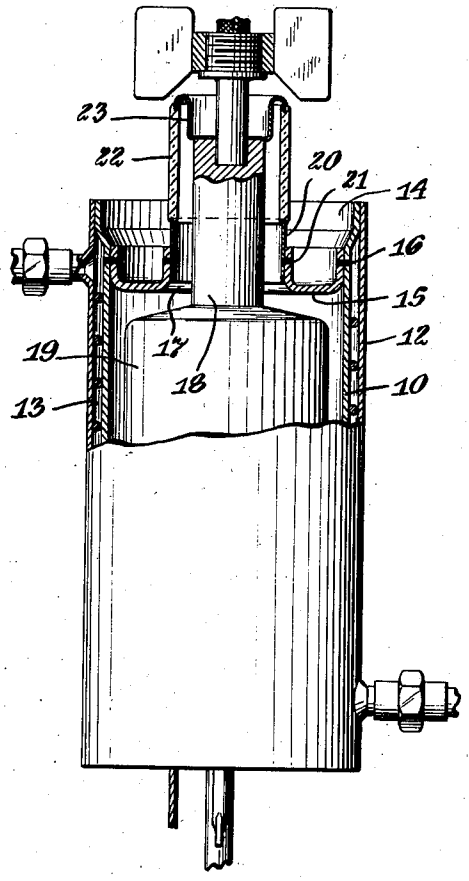
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DISCHARGE DEVICE

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DISCHARGE DEVICE

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3 Claims. (Cl. 250—27.5)

This invention is a division of our prior application directed to a metal-casing discharge device, Serial No. 358,474, filed September 26, 1940, entitled "Discharge device with water cooled baffle," the present invention likewise relating to discharge devices, and to such devices utilizing metal casings.

An object of the invention is to provide improved means for mounting the anode within said casing.

A further object of the invention is to obtain an insulative mounting of improved and more rugged character than has heretofore been accomplished.

A further object of the invention is to provide an easily assembled structure of metal casing and anode insulated from said casing.

Further objects will appear both by direct recitation thereof and by implication from the context as the description progresses.

In the accompanying drawing, the single view shown is a partial elevation and longitudinal section of a discharge device constructed in accordance with the present invention.

In the specific embodiment of the invention illustrated in said drawing a tubular closed and evacuated inner casing 10 is provided preferably constructed of stainless steel and represented in conformity with the showing of the said prior application, to which reference may be had for details not here shown as not deemed essential to the understanding of the present invention. Suffice it to say, that the said casing 10 is shielded at its cylindrical wall with an outer casing 12 spaced from the inner casing to provide a cooling space 13 between the casing. The feature of the present invention is not dependent upon the presence of the cooling space, reference being made thereto at this time merely to orient the present invention with respect to the aforementioned application.

The upper portion of the closed casing 10 has a bent-out marginal end portion 14 which engages the outer casing 12 and is secured thereto entirely around the periphery.

Below the flared out portion 14, is provided a dish-shaped upper header member 15 which constitutes part of the end closure for the said casing. This header member is preferably trough shaped, with the flanges of the trough directed outwardly. The outer flange is welded, as at 16, to the casing entirely around the periphery so as to obtain a vacuum-tight seal. The inner flange, which is annular and in parallelism with the outer flange, provides a central opening 17 for passage therethrough of the stem portion 18 of anode 19 situated within the casing in proximity to the said header 15. The size of the opening 17 within the inner flange of the header is ample to obtain insulative spacing of the stem portion 18 of the anode inwardly out of contact from said header flange. The header 15, like casing 10, is preferably made of steel. It is desired to support the anode from this steel and to obtain a vacuum-tight seal as well as a permanent seal and adequate support. There is no known insulative material which will accomplish the purpose directly by inclusion between the anode and said header. The differences in the coefficients of expansion must be considered, as those differences are inclined to cause cracks and crevices.

According to the present invention, a tubular member constituting a collar 20 is secured with a lower margin of itself engaging the inner cylindrical surface of the hole-forming flange of the header. This collar is preferably of nickel-cobalt-iron alloy sold under the trade name "Kovar." This material is strong, but expensive, and is accordingly employed in minimum amounts both as to thickness and length in formation of the collar. Where the cylindrical surfaces of the collar and header flange are juxtaposed or in surface contact, the same are secured together, as at 21, so as to obtain an adequate vacuum seal and support. The upper marginal portion of the collar projects above the header flange and mounted therein is a cylinder of borosilicate glass 22. The coefficients of expansion of the glass and the "Kovar" collar are substantially the same, and by sealing the glass to the "Kovar" a permanent union is obtained with little, if any, likelihood of ruptures occurring at the joint. At the upper end of the cylinder of glass 22 the outwardly curled edge of a cup 23 is similarly sealed, said cup likewise preferably being a nickel-cobalt-iron alloy such as heretofore described and identified as sold in the trade under the name of "Kovar." The bottom of the cup is reentrant with respect to the cylinder of glass 22 and is flat on its bottom for conveniently securing the upper end of anode stem 18 thereto. The "Kovar" cup and collar are both of adequate strength to absorb the stresses and strains resultant from differences in coefficients of expansion therefrom of attached parts, and since there is practically no stress between the "Kovar" parts and the glass cylinder, likelihood of rupture is thereby avoided but at the

same time a rigid insulative support is provided from the header to the anode.

It is apparent that many modifications may be made in the preferred structure illustrated and, accordingly, we desire only such limitations to be imposed upon our invention as are necessitated by the spirit and scope of the following claims.

We claim:

1. A discharge device comprising a closed tubular casing, an anode within said casing, a header forming a part of the closure for said casing, a collar secured vacuum tight to said header and likewise forming part of the closure, an insulative member carried by the last-mentioned member and having substantially the same coefficient of expansion thereas, and means closing the outer end of said insulative member and having a vacuum-tight seal therewith, said means supporting the anode and having a part thereof which under expansion moves the anode opposite to movement thereof due to expansion of the collar.

2. A discharge device comprising a closed tubular casing, an anode within said casing, a header forming a part of the closure for said casing, said casing and header being constructed of like materials, an unlike material secured vacuum tight to said header and likewise forming part of the closure, and an insulative member carried by the last-mentioned member and having substantially the same coefficient of expansion thereas, and a cup having a curled edge sealed to the upper part of said insulative member, said cup being reentrant into said insulative member and supporting the anode.

3. A discharge device comprising a tubular casing, an anode within said tubular casing, a conductive support extending through the upper end of said tubular casing, insulation encompassing a part of said support and having attached connection therewith, a tubular member sealed to said insulation and extending into said tubular casing and an annular trough-shaped header having its inner flange secured vacuum-tight to said tubular member and its outer flange secured vacuum-tight to said tubular casing.

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