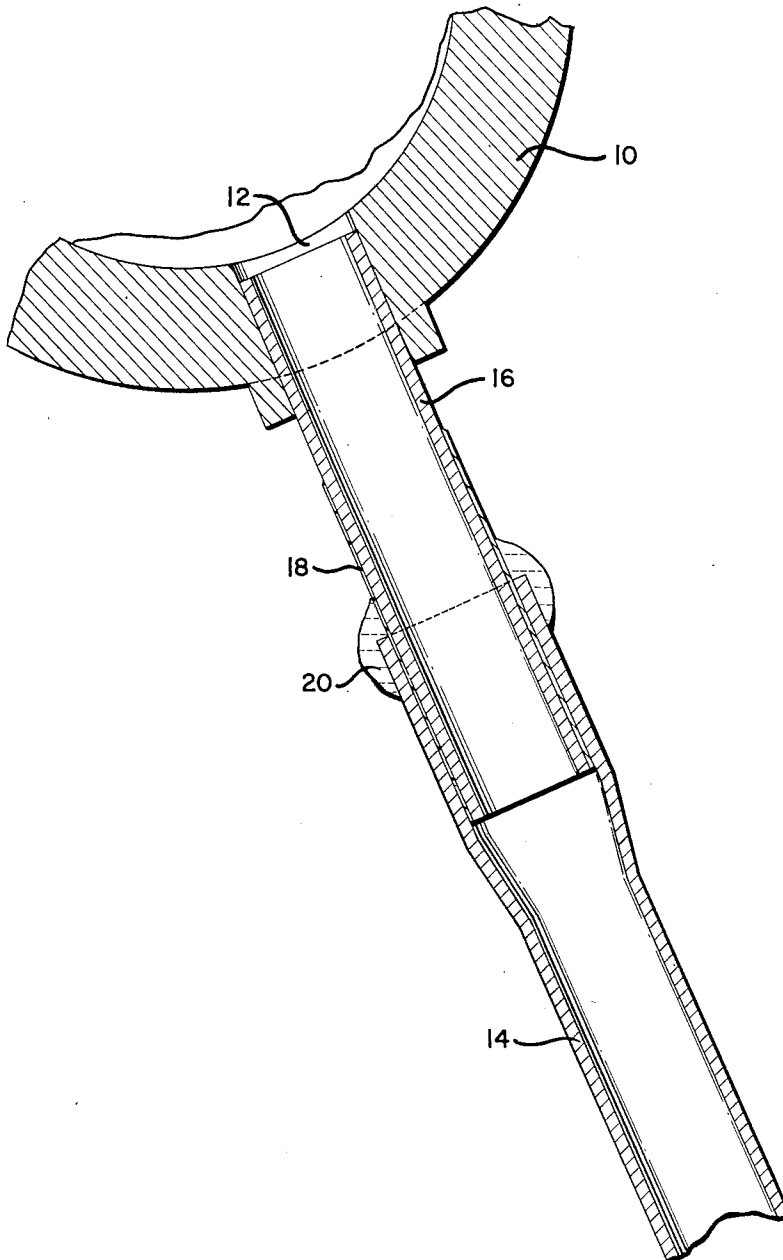


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METHOD OF JOINING AN ALUMINUM TUBE
TO A STEEL REFRIGERATOR COMPRESSOR
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METHOD OF JOINING AN ALUMINUM TUBE TO A STEEL REFRIGERATOR COMPRESSOR

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3 Claims. (Cl. 29—471.7)

This invention relates to refrigerating apparatus and more particularly to the method of connecting aluminum tubing to a steel compressor or the like.

The desirability of utilizing aluminum heat exchangers in combination with steel compressors in refrigeration systems has long been recognized, but considerable difficulty has been experienced in attaching the aluminum parts to the steel compressor is that the flux normally required for joining the aluminum to the steel must all be thoroughly removed from the interior of the system lest it cause trouble during subsequent operation of the compressor.

It is an object of this invention to provide a method of joining aluminum to steel whereby it is not necessary to use any flux in making the final connection between the aluminum parts and the steel parts.

Another object of this invention is to provide a method of connecting aluminum tubing to steel tubing by a method which prevents reduction in the internal diameter of the aluminum tubing directly adjacent the point where it is welded to the steel tubing.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein a preferred form of the invention is clearly shown.

In the drawing:

The sole figure in the drawing is a fragmentary sectional view showing an aluminum tube attached to a steel compressor in accordance with my improved method.

Referring now to the drawing, reference numeral 10 designates a steel compressor or the like having a passage 12 provided therein to which an aluminum tube or conduit 14 is adapted to be connected. In order to eliminate the need for directly connecting the aluminum tubing 14 to the steel compressor, an adapter 16 has been provided as shown. The adapter 16 is a section of steel tubing having an aluminum coating 18 provided at its one end. Any one of several well-known processes of coating the steel tubing with aluminum may be used. In applying the aluminum coating 18 to the steel tube section 16 a flux can be used, if desired, since the coated end of the tube can be pinched closed during the process of coating so as to prevent the introduction of any of the flux or aluminum into the interior of the tube section 16. After this initial coating has been added, the pinched end of the tube can be cut off or opened. The uncoated end of the adapter or tube section 16 is then silver soldered or brazed to the compressor 10. Any method may be used in attaching the adapter 16 to the compressor 10 so long as it does not involve the objectionable use of any flux which might enter the compressor 10 or the interior of the adapter 16. Little difficulty is experienced in attaching the steel adapter 16 to the steel compressor shell 10 even though a flux is used as the connection can be made between the two steel parts without leaving any flux inside the joint. Furthermore, the type of flux used in silver soldering or in brazing is much less corrosible than that which is needed for attaching aluminum to steel.

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The end of the aluminum tubing 14 is thereafter slipped onto the coated end of the steel tube 16 and inert gas welded to the aluminum coating 18. In making the connection between the aluminum tubing and the steel adapter 16, the aluminum tubing is arranged to overlap the adapter 16 throughout a predetermined distance whereby the steel adapter 16 serves to reinforce the end of the aluminum tubing 14 not only during the process of welding the tubing 14 to the adapter 16 but also throughout the life of the equipment. In view of the fact that the temperatures required for welding aluminum to aluminum are not high enough to soften the steel but are high enough to soften the aluminum it is obvious that that portion of the steel insert 16 which projects into the aluminum tube 14 serves to prevent collapse or distortion of the aluminum tubing 14 during the welding operation.

By virtue of the fact that aluminum may be electrically welded to aluminum without the use of any flux it is obvious that the above described method makes it possible to join aluminum parts to steel parts in refrigeration systems and the like without getting any flux into the interior of the system. Reference numeral 20 designates a fillet of aluminum which is added during the process of arc welding the tube 14 to the coating 18. Any process which does not require the introduction of any flux into the refrigerant line may be used for bonding the aluminum tube 14 to the aluminum coating 18 on the steel tube section 16.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted as may come within the scope of the claims which follow.

What is claimed is as follows:

1. The method of joining an aluminum refrigerant line to a steel compressor which comprises first coating one end portion only of a steel tube with aluminum, secondly silver soldering the uncoated end of said steel tube to the body of said compressor and thereafter inert gas welding said aluminum refrigerant line to said aluminum coating.

2. The method of joining an aluminum refrigerant line to a steel compressor which comprises coating one portion of a steel tube with aluminum, silver soldering the uncoated end of said steel tube to the body of said compressor and thereafter welding said aluminum refrigerant line to said aluminum coating so as to form a refrigerant tight joint.

3. The method of joining the end of an aluminum tube to a steel refrigerator compressor which comprises coating one end portion only of a steel adapter tube with aluminum, silver soldering an uncoated end of said steel adapter tube which has an aluminum coating only on one end to the body of said compressor and thereafter welding said end of the aluminum tube to the aluminum coating on said adapter tube so as to form a refrigerant tight joint, and finally forming a fillet at the joint between the aluminum and steel tubes.

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