

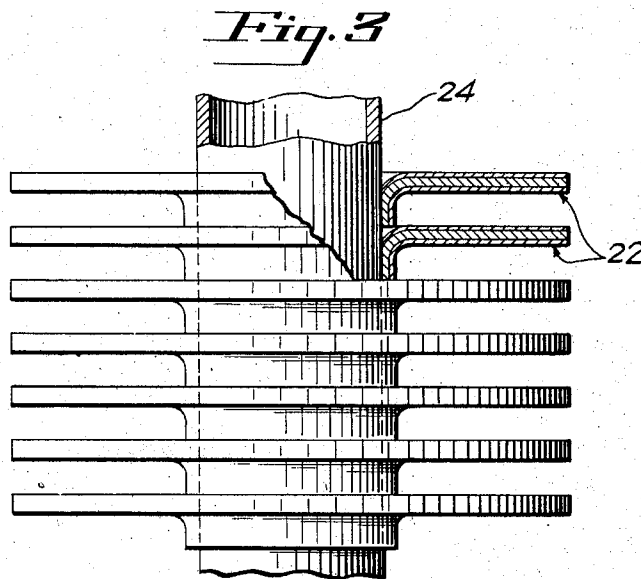
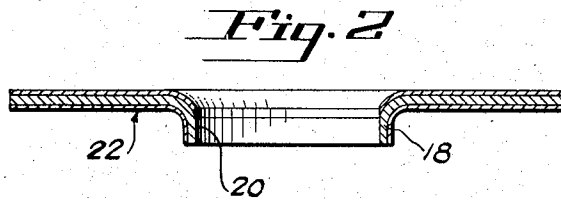
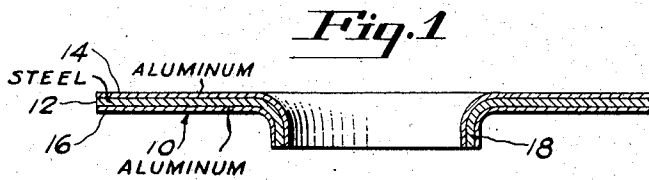
Jan. 30, 1945.

G. C. BARNES

2,368,403

METHOD OF MANUFACTURING HEAT RADIATORS

Filed Oct. 21, 1941



INVENTOR
Gilbert C. Barnes
BY
Harris G. Luther
ATTORNEY

UNITED STATES PATENT OFFICE

2,368,403

METHOD OF MANUFACTURING HEAT RADIATORS

Gilbert C. Barnes, Manchester, Conn., assignor to
United Aircraft Corporation, East Hartford,
Conn., a corporation of Delaware

Application October 21, 1941, Serial No. 415,917

2 Claims. (Cl. 29—157.3)

This invention relates to improvements in heat radiating structures and has particular reference to an improved fin construction for a heat dissipating or radiating body such as an air-cooled internal-combustion engine cylinder.

An object of the invention resides in the provision of an improved heat radiating body of the character indicated having fins formed of two or more metals arranged in mutually bonded layers.

A further object resides in the provision of an improved heat radiating body of the character indicated including a tubular body and heat radiating fins thereon in which the finned surfaces are formed of a metal different from the metal of which the body is formed and in an improved manner of securely attaching such fins to the outer surface of the body.

Other objects and advantages will be more particularly pointed out hereinafter or will become apparent as the description proceeds.

In the accompanying drawing, in which like reference numerals are used to designate similar parts throughout, there is illustrated a suitable mechanical embodiment for the purpose of disclosing the invention. The drawing, however, is for the purpose of illustration only and is not to be taken as limiting or restricting the invention since it will be apparent to those skilled in the art that various changes in the illustrated construction may be resorted to without in any way exceeding the scope of the invention.

In the drawing, Fig. 1 is a transverse sectional view of a suitable metal blank for a cooling fin.

Fig. 2 is a transverse sectional view similar to Fig. 1 showing the fin produced from the blank illustrated in Fig. 1, and

Fig. 3 is an elevational view of a finned heat radiating body, a portion being broken away and shown in section to better illustrate the construction thereof.

Referring to the drawing in detail, the fin blank, particularly illustrated in Fig. 1 and generally indicated by the numeral 10, is formed of a commercial bi-metallic sheet metal product. For example, the metal sheet from which the blank is formed may have an intermediate or center layer 12 of a suitable steel and may have outer layers 14 and 16 of aluminum securely bonded to the surfaces of the steel inner layer. This construction provides a fin having adequate strength and good heat conducting properties since the steel inner layer provides the desired strength and together with the aluminum outer

layers provides an easy path for the conduction of heat through the metal.

The blank 10 may comprise an apertured member of any suitable shape such as the illustrated annular member of circular, or generally circular, shape having a central aperture surrounded by a struck up flange 18 of a depth approximately equal to the desired fin spacing. This blank may be formed in a suitable stamping machine by a method well known to the art. After the blank has been formed, as illustrated in Fig. 1, the outer metal coating is removed from the inside of the flange 18 by a suitable machining or grinding process to provide a straight walled aperture of substantially the same size as the outer surface of the body upon which the fins are to be secured, the finished surface of the flanged portion of the fin being indicated at 20 in Fig. 2 and constituted by the metal of the intermediate or steel layer. The fins, as generally indicated at 22 in Figs. 2 and 3, are then secured upon the exterior of the heat radiating body such as a steel walled engine cylinder barrel 24 in such a manner that the spacing is determined by the contact of the ends of the flanges 18 with the adjacent fins.

The fins may be secured to the cylinder barrel by a suitable brazing or welding operation forming a fused metallic bond which will provide good heat transferring qualities between the cylinder barrel and the fins. Such an operation is particularly facilitated by the fact that the contacting surfaces of the cylinder barrel and the fins are both of substantially the same material thus obviating the difficulty of attempting to secure fins of one material to a cylinder barrel of a different material. Since in the illustrated example hereinabove described, the cylinder barrel is of steel and the portions of the fins contacting the outer surface of the cylinder barrel are also of steel, a suitable bond between these surfaces can be readily obtained.

While a combination of steel and aluminum fins with a steel heat radiating body has been particularly described for the purpose of disclosing the invention, it is to be understood that the invention is not limited to the particular metals mentioned but that the improved construction may be readily applied to other combinations of different metals.

While a suitable mechanical embodiment for the purpose of disclosing the invention has been hereinabove described and illustrated in the accompanying drawing, it is to be understood that the invention is not limited to the particular em-

bodiment so described and illustrated but that such changes in the size, shape, construction and arrangement of the various parts may be resorted to as come within the scope of the subjoined claims.

Having now described the invention so that others skilled in the art may clearly understand the same, what it is desired to secure by Letters Patent is as follows:

1. The method of manufacturing a heat radiator which comprises, forming annular fins from a metal sheet having an intermediate layer of metallic material and outside layers of a different metallic material, forming a central flange in each fin, removing the layer of said different material from the internal surface of each flange to expose the material forming the intermediate layer and form a straight wall opening in the

flange having the same shape and fitting closely over the tube on which said fins are to be mounted, assembling said fins on said tube, and uniting said flanges to said tube by a fused metallic bond.

2. The method of manufacturing a heat radiator which comprises, forming annular fins from a metal sheet having an intermediate layer of steel and outside layers of aluminum, forming a central flange in each fin, removing the layer of aluminum from the internal surface of each flange to expose the steel and form a straight wall opening in the flange having the same shape and fitting closely over the tube on which said fins are to be mounted, assembling said fins on said tube, and uniting said flanges to said tube by a fused metallic bond.

GILBERT C. BARNES.