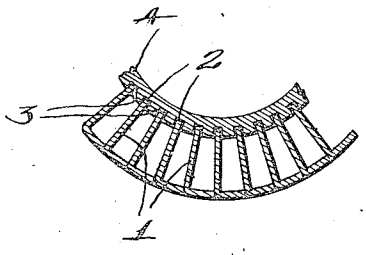
July 23, 1929. C. P. GRIMES 1,721,878

METHOD OF ATTACHING COPPER FINS TO CAST IRON CYLINDERS

Filed Sept. 25, 1926

Fig. 1.



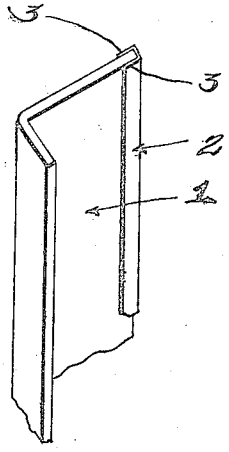


Fig. 2.

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Patented July 23, 1929. 1,721,878

UNITED STATES PATENT OFFICE.

CHARLES P. GRIMES, OF SYRACUSE, NEW YORK.

METHOD OF ATTACHING COPPER FINS TO CAST-IRON CYLINDERS.

Application filed September 25, 1926. Serial No. 137,669.

This invention relates to attaching to a metal part, a projection or projections, as fins, of metal having a different coefficient of expansion or different coefficient of heat conductivity than the metal of said parts, and has for its object a method or process of accomplishing such result, and particularly a method of attaching to iron cylinders to be embodied in an internal combustion engine, copper heat radiating fins or heat radiating fins of a metal having a different coefficient of expansion than iron, or a method or process of forming a secure and efficient heat conducting joint between the iron cylinders and the heat radiating fins or projections of copper.

The invention consists in the steps hereinafter set forth and claimed.

In describing this invention reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a fragmentary sectional view of a cylinder embodying my invention.

Figure 2 is a fragmentary view of a heat conducting fin with a bonding strip applied thereto.

This method of attaching to metal parts, as cast iron engine cylinders, heat radiating fins or projections of a metal having a greater or different coefficient of expansion or heat conductivity than iron, as copper fins, comprises supporting the fins or projections with a bonding strip of a metal, having an affinity for both the metal of the fins, as copper, and the metal of the part to which the fin is to be attached, as iron, and pouring the molten metal or iron to form said part around the margins of the fins in contact with the bonding strip, whereby the bonding strip is fused, and forms a solution which penetrates or impregnates with the iron and also unites with the copper.

In carrying out the process a suitable mold of any well known construction is employed such as is used in attaching steel fins to cylinders. In attaching steel fins to the cylinders the fins are supported in the mold with the margins thereof projecting into the mold cavity which forms the cylinder. When the iron is cast in the mold cavity, it flows around the margins of the fins. As this mold construction and the casting operation is well known further description is thought to be unnecessary.

In carrying out my invention the fins are supported in the mold in the usual manner, with their margins projecting into the mold cavity which forms the cylinder, and a bonding strip applied to and temporarily attached to such projecting margins, the bonding strip being usually of zinc bent U-shaped so, that, opposite sides thereof lap opposite sides of the projecting margins or fins, and then the metal is poured into the mold cavity in the usual manner.

1 designates the copper fins, 2 is the bonding strip of zinc, they being here shown as built U-shaped, so that, the side 3 thereof lap opposite sides of the margins of the fins which margins project into the mold cavity, which forms the cylinder. The strips are temporarily secured to the fins by a suitable flux as tin coated on the fins. The copper fins are tinned and then the U-shaped strip sweated thereon, as by clamping the strip on the margin of the fins between the heated jaws.

4 designates the cylinder which is cast around the margin of the fins in contact with the U-shaped bonding strip.

During the casting operation the heat of the molten metal fuses the bonding strip and bonding strip penetrates the iron or goes into solution with the iron, so that, when the metal cools a firm integral heat conducting joint is obtained between the fins and the cylinder.

What I claim is:—

The process of attaching to cast iron cylinders for internal combustion engines, heat radiating fins of a metal having a different coefficient of expansion from that of the cylinder consisting in supporting the fins with their margins in the mold cavity for the cylinder with a U shaped bonding strip enclosing the margin of each fin, of a metal having a fusing point less than the temperature of the molten iron with which strip the molten metal comes in contact, and with the strips spaced apart whereby the metal of the cylinder casting flows between adjacent fins and the strips thereon, and pouring the molten metal around and in contact with the bonding strips.

In testimony whereof, I have hereunto signed my name, at Syracuse, in the county of Onondaga, in the State of New York, this 13th day of September, 1926.

CHARLES P. GRIMES.