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MEANS FOR PREPARING ALUMINUM ALLOYS FOR HEAT TREATMENT

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Fig. 1.

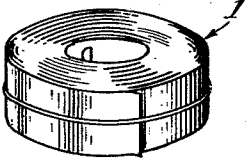


Fig. 2.

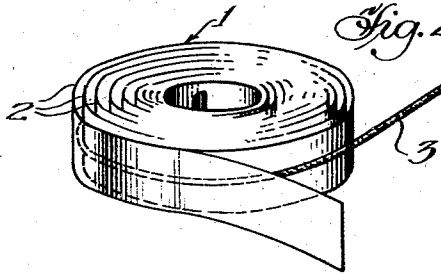


Fig. 3.

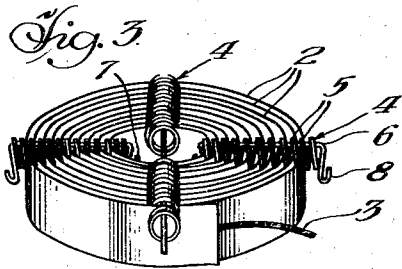


Fig. 4.

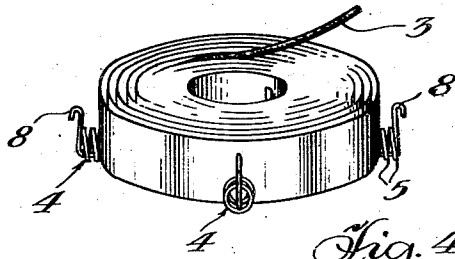


Fig. 5.

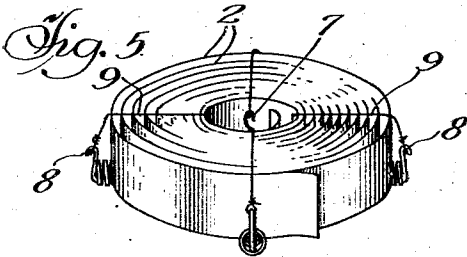


Fig. 6.

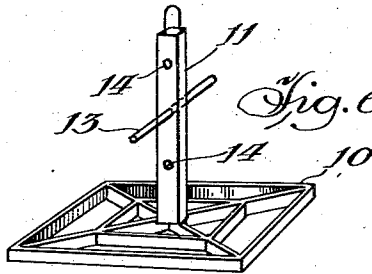


Fig. 7.

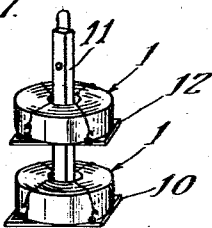
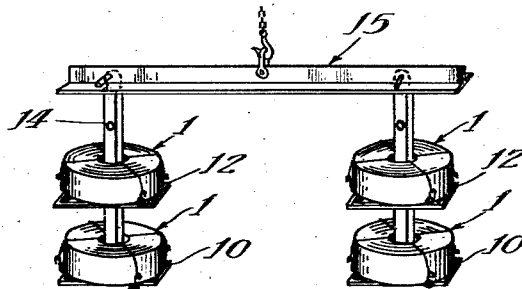


Fig. 8.



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MEANS FOR PREPARING ALUMINUM ALLOYS
FOR HEAT TREATMENTVictor Eleaph Peterson, Niles, Mich., assignor to
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4 Claims. (Cl. 263—2)

1

The present invention relates to a novel method of preparing aluminum alloys for heat treatment and comprises taking the coil of metal as it is received from the mill, rewinding it so as to space the successive rings or individual coils a predetermined distance apart, and retaining these rings or coils in that spaced relation during the period of heat treatment. This method is carried out without in any way altering or deforming the metal of the coil in an endeavor to maintain the individual rings or coils in spaced relation and results in a complete elimination of all waste of metal incident to such deformation.

The invention further provides a novel means for retaining the successive and individual coils or rings of metal in such a way as to provide a minimum contact between the spacing means and the metal and thereby assure uniformity of the treated product throughout. By spacing the individual coils or rings of the metal in the proposed manner, the heat treating medium, whether it be circulating hot air brought to the required temperature, or a solution adapted to be heated and retain its heat within the critical temperature range desired for bringing the metal to the required heat, the novel method permits the uninterrupted circulation or passage of the heat treating medium to simultaneously and uniformly bring up to the desired or required temperature the entire mass of metal of the coil and thereby result in a completely uniform and standardized product.

Further objects are to provide a construction of maximum simplicity, efficiency, economy and ease of assembly and operation, and such further objects, advantages and capabilities as will later more fully appear and are inherently possessed thereby.

The invention further resides in the construction, combination and arrangement of parts illustrated in this accompanying drawing, and while there is shown therein a preferred embodiment, it is to be understood that the same is susceptible of modification and change, and comprehends other details, arrangements of parts, features and constructions without departing from the spirit of the invention.

In the drawing:

Figure 1 is a view in perspective of a coil of metal as it is received from the mill.

Figure 2 is a perspective view of the coil of metal as it is rewound in spaced relation with a length of rope or the like separating each individual coil or ring a predetermined amount.

Figure 3 is a perspective view of the coil of

2

metal rewound as in Figure 2 and with a plurality of coil springs having their individual loops forced into the space between adjacent rings of the metal.

Figure 4 is a view similar to Figure 3 but with the position of the coil of metal reversed and showing the rope being removed.

Figure 5 is a view similar to Figure 4 and showing the manner of anchoring the ends of the coil springs to retain the individual rings of the coil of metal in their predetermined spaced relation.

Figure 6 is a view in perspective of one of the coil racks for holding the coils of metal during heat treatment.

Figure 7 is a view in perspective of two of the coils of metal supported on the rack.

Figure 8 is a view in perspective of two of the loaded racks suspended from a bar or rail preparatory to heat treatment.

In the novel disclosed method of preparing aluminum alloys for heat treatment, the alloy in the form of a continuous band or strip 1 coiled upon itself as shown in Figure 1, is received from the mill and this aluminum may be alloyed with suitable ingredient or ingredients for giving the desired characteristics to the finished product. It is next rewound into a coil in which the rings or individual coils 2 are spaced apart by suitable means such as a rope 3, so as to give an accurate spacing between them. After the coil is completely rewound in this manner, a plurality of relatively heavy coil springs 4 having their individual loops 5 spaced apart an amount desired in the coil of metal to be treated, are then placed over the spaced rings of the metal with each individual loop of the spring forced down between successive rings or coils 2 of the metal to be treated.

In the drawing, four of such springs 4 are shown spaced approximately 90° apart. These springs are each provided with a rod 6 suitably affixed to the spring as by welding or the like, having a hook 7 and 8 at their opposite ends so that after the springs have been placed in position and the coil of metal to be treated is arranged in the spaced relation and its position reversed as shown in Figures 4 and 5, wires 9 are anchored onto the inner hook 7 and then tightly drawn over the coils or rings 2 and anchored onto the hook 8 at the opposite end in order to retain the individual coils or rings of the metal in their proper spaced relation. One or more of these coils of metal are then placed upon a rack 10 carried by a support 11. As shown in the drawing, any suitable number of these coils

3

of metal may be carried upon spaced carrying racks with an upper coil placed in spaced relation by means of an auxiliary rack 12 retained in that spaced relation by a pin or rod 13 engaged in an opening 14 in the vertical support 11. This vertical support is then attached to a carrying rail 15 and moved into a furnace or into a tank containing a solution capable of heating the metal at the desired temperature and for the desired or required period of time. Excellent results have been secured by heating the metal and maintaining it at a temperature of approximately 910° to 950° F., and for a period of from ten minutes to one hour or longer, depending upon the thickness or gauge of the metal to be treated.

After the metal has been heated for the desired period and at the desired or required temperature, it is removed from the furnace or bath and given a quick quench in water, oil or other suitable cooling medium.

By this novel method and means of retaining the coil of metal in a definite, spaced relation without altering or deforming the metal itself, a distinct saving in metal is provided as there is no resulting scrap, and all of the metal is uniformly heat treated throughout. By the use of the coil springs, a minimum of surface contact is had between the loops of the springs and the individual rings or coils of the metal being treated. Thus the heating fluid, whether air or liquid, comes into intimate contact with the surface of the metal with maximum effect.

Although I have disclosed certain temperatures and periods in which I have secured excellent results, these depend somewhat upon the ingredients alloyed with the aluminum. Furthermore, although I have referred to the method as being particularly applicable to the treatment of aluminum alloys, it is not limited thereto and may also be found useful in the annealing of similar metals.

4

Having thus disclosed my invention, I claim:

1. Means for preparing a coil of aluminum alloy for heat treatment, comprising members provided with spaced convolutions for spacing apart and maintaining each individual coil of the metal in spaced relation, a rack upon which the spaced coil of metal is placed, and a support from which the rack is suspended during heat treatment.

2. Means for preparing a coil of aluminum alloy for heat treatment, comprising a plurality of spring coils having spaced loops with successive loops of the springs adapted to be positioned intermediate adjacent individual coils of the metal to thereby retain these individual coils in spaced relation during heat treatment.

3. Means for preparing a coil of aluminum alloy for heat treatment, comprising spring coils having spaced loops adapted to be positioned over the coil of metal with spaced loops of the spring coils positioned between adjacent rings of the coil of metal, and means at the opposite ends of the spring coils for anchoring and retaining the spring coils in position and the rings of metal in their predetermined relation during heat treatment.

4. Means for preparing a coil of aluminum alloy for heat treatment, comprising spring coils having spaced loops adapted to be positioned over the coil of metal with spaced loops of the spring coils positioned between adjacent rings of the coil of metal, hooks provided at the opposite ends of the spring coils, and means for connecting these hooks and anchoring and retaining the spring coils in position and the rings of metal in their predetermined relation during heat treatment.

VICTOR ELEAPH PETERSON.