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UNITED STATES PATENT OFFICE.

FELIX THOMAS, OF FRANKFORT-ON-THE-MAIN, GERMANY, ASSIGNOR TO THE FIRM CHEMISCHE FABRIK GRIESHEIM-ELEKTRON, OF FRANKFORT-ON-THE-MAIN, GERMANY.

METHOD FOR ROLLING MAGNESIUM ALLOYS.

No Drawing. Application filed August 24, 1921. Serial No. 494,949.

To all whom it may concern:

Be it known that FELIX THOMAS, a citizen of the German Republic, residing at 53 Paul Ehrlichstrasse, Frankfort-on-the-Main, Germany, has invented certain new and useful Improvements in the Method for Rolling Magnesium Alloys (for which I have filed application in Germany Aug. 21, 1919, application No. C. 28265), of which the following is a specification.

This invention relates to a method for rolling magnesium alloys, especially alloys of magnesium with from 3-10% of zinc.

Alloys of magnesium containing small amounts of zinc, which although in many respects closely resemble aluminium, as regards their physical and metallurgical properties, can nevertheless not be rolled like aluminium. In rolling sheets or bars of such alloys of magnesium containing small amounts of zinc, the material usually breaks in a direction approximately parallel to the axis of the rollers, or cracks are formed.

Experiments have shown that for rolling magnesium alloys of the above-described kind it is necessary to exercise greater care in maintaining the temperature during rolling than is the case with any other metal. In particular it has been found that the primary condition for a good rolling of bars to thin sheets is that the material to be rolled should be completely heated throughout in the heating furnace to about 220-250° C., and this should be repeated in accordance with the thickness of the sheet to be rolled, the metal being reheated after a certain number of passes. In practice the temperature of the reheating furnace is kept, considerably higher, (approximately 400° C.), in order to accelerate the heating throughout and the necessary recrystallization of the metal. The material to be rolled, which is slightly superheated, is then cooled in the air and the beginning of the correct temperature range for rolling is ascertained by means of an acoustic method. This acoustic method is based on the fact that when the metal is too hot its sound is at first wooden when knocked against the rolling table, but when the correct rolling temperature is approached, the sound becomes metallic.

The fact that exact temperature maintenance is necessary in rolling magnesium-zinc alloys, is one that could not be anticipated, the less so as pure magnesium can be rolled at any temperature, and the more easily in proportion as the temperature is higher.

What I claim and desire to secure by Letters Patent is:—

1. The method of rolling magnesium-zinc alloys which comprises submitting the alloy to be rolled to heat in such a way that its temperature right through is 220-250° C. and thereupon rolling said heated alloy at said temperature.

2. The method of rolling magnesium-zinc alloys which comprises submitting the alloy to be rolled to heat in such a way that its temperature right through is 220-250° C., thereupon passing said heated alloy at the said temperature through rolling mills and after a certain number of passes before further rolling reheating the alloy so that it reaches the temperature of 220-250° C. right through.

3. The method of rolling magnesium-zinc alloys which comprises heating the alloy to be rolled to a slightly higher temperature than that required for rolling the alloy so as to accelerate heating right through and the necessary recrystallization of the metal, thereupon cooling said alloy and as soon as the alloy has reached the temperature of 220-250° C. rolling said alloy.

4. The method of rolling magnesium-zinc alloys which comprises heating the alloy to a slightly higher temperature than that required for rolling so that the alloy is quickly heated right through, thereupon cooling in air, and as soon as the wooden sound of the alloy when knocked against the rolling table has changed to a metallic sound, rolling said alloy.

5. The method of rolling magnesium-zinc alloys which comprises submitting the alloy to be rolled to heat in a furnace heated to a temperature of approximately 400° C., thereupon cooling the alloy in air, and as soon as the alloy has reached the temperature of 220-250° C., rolling said alloy.

6. The method of rolling magnesium-zinc alloys which comprises submitting the alloy to be rolled to heat in a furnace heated to a temperature of approximately 400° C., thereupon cooling the alloy in air, and as soon as the wooden sound of the alloy when

knocked against the rolling table has changed to a metallic sound, rolling said alloy.

7. The method of rolling magnesium-zinc alloys which comprises submitting the alloy to be rolled to heat in a furnace heated to a temperature which is higher than the temperature required for rolling, thereupon cooling the alloy to the temperature of 220-250° C., rolling said alloy at said temperature and after a certain number of passes introducing said alloy into said heating furnace and repeating the cooling and rolling operations.

In testimony whereof I affix my signature.

DR. FELIX THOMAS.