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UNITED STATES PATENT OFFICE.

RICHARD L. TEMPLIN, OF PARNASSUS, PENNSYLVANIA, ASSIGNOR TO AMERICAN MAGNESIUM CORPORATION, OF NIAGARA FALLS, NEW YORK, A CORPORATION OF NEW YORK.

EXTRUDING MAGNESIUM.

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To all whom it may concern:

Be it known that I, RICHARD L. TEMPLIN, citizen of the United States, residing at Parnassus, in the county of Westmoreland and State of Pennsylvania, have invented certain new and useful Improvements in Extruding Magnesium, of which the following is a specification.

My invention relates to improvements in methods of working metallic magnesium, and one of the objects of the invention is to secure suitable working conditions for the extrusion of the metal. Another object of the invention is to determine the approximate temperature as well as the approximate range of temperature within which the metal may be extruded, taking into consideration the power consumed in forcing the metal through the die, the rate of flow and also the physical characteristics of the extruded metal. The difficulty heretofore has been to secure extruded magnesium which has a smooth, clean surface, free from check marks and other imperfections. These objectionable features are eliminated by working the magnesium in accordance with my invention.

While it is possible to extrude cold magnesium, the consumption of power is greater for a given rate of flow, than would be necessary if the temperature were higher. On the other hand, the lower the extruding temperature, the higher will be the tensile strength of the extruded metal. The most desirable temperature therefore, is that which will consume the least amount of power for a given rate of flow and at the same time impart the most desirable physical properties to the extruded metal, such as high tensile strength, good elongation and reduction of area and a smooth, clean surface.

If the temperature of the metal is raised above a certain degree discovered as being the most satisfactory for extrusion, then the metal begins to stick to the die, gets jagged and begins to crumble. As the result of a series of tests, I have discovered that the range of temperature within which metallic magnesium may be most satisfactorily extruded is from 650 to 800 degrees F. Within this range a temperature of 750 degrees F. has been found to be the most desirable; above this temperature, or at a temperature of about 800 degrees F., defects in the metal occur as above pointed out, making extrusion thereafter impracticable.

The metal may be extruded by a die-expressing operation in any suitable extrusion press and any suitable means may be used in heating the metal to the desired temperature. By the term "magnesium", I comprehend not only the metal as commercially produced but also such alloys of magnesium as have substantially the same physical properties as the metal itself and therefore lend themselves to the same treatment. The shape of the extruded article is not material to the invention, as it may take the form of bars, rods, wire, angles or any other structural shape.

I claim:

1. The method of plastically working magnesium comprising die-expressing the metal at a temperature of approximately 750° F.

2. The method of plastically working magnesium comprising die-expressing the metal within a temperature range from 650° to 800° F.

In testimony whereof I affix my signature.

RICHARD L. TEMPLIN.