

# UNITED STATES PATENT OFFICE

2,247,804

## PERMANENT MAGNET

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No Drawing. Application February 23, 1932.  
Serial No. 258,023

3 Claims. (Cl. 148—11.5)

The present invention relates to a permanent magnet and to a method of making the same.

It is one of the objects of the invention to provide a permanent magnet alloy which may be rolled quite thin and which has a sufficiently high coercive force to permit it to serve as an efficient permanent magnet when magnetized in the direction of its least dimension.

The novel features which are characteristic of my invention are set forth with particularity in the appended claims. The invention itself however will best be understood from reference to the following specification.

In carrying out my invention I employ an alloy which consists substantially of silver, manganese and aluminum and has substantially the following range of ingredients:

	Per cent
Aluminum -----	2 to 8
Manganese -----	5 to 15
Silver -----	Remainder

The alloy usually is cast into bars and heated at a temperature of about 800° C. or higher if desired. A heating period of about fifteen minutes is satisfactory but the use of a longer heating period is not detrimental. The alloy is quenched from the 800° temperature in a suitable cooling medium such as water and then cold reduced about 50 to 75%. The cold rolled alloy is annealed or age hardened for about 48 to 72 hours at a temperature of approximately 250° C. The quenching action makes the alloy easy to cold roll and apparently brings all the components of the alloy into solution to thereby in-

crease the effectiveness of the age-hardening treatment. While alloys within the above noted ranges provide satisfactory results, I prefer to employ an alloy containing about 86.5% silver, about 8.8% manganese and about 4.7% aluminum. Such an alloy when prepared in accordance with my improved process has an intrinsic saturation value ( $4\pi j$ ) of 1305, a coercive force ( $H_c$ ) of 6000, a residual induction  $B_r$  of 610 and a maximum value of  $(\beta_d H_d) = 1,460,000$ .

What I claim as new and desire to secure by Letters Patent of the United States is:

1. The method of making a permanent magnet alloy containing about 2 to 8% aluminum, 5 to 15% manganese with the remainder substantially silver which comprises heating the alloy at a temperature of at least about 800° C., quenching, cold rolling the alloy and thereafter aging it.

2. The method of making a permanent magnet alloy containing about 2 to 8% aluminum, about 5 to 15% manganese with the remainder substantially silver, which comprises heating the alloy at a temperature of at least about 800° C., quenching, cold reducing the alloy at least 50%, and thereafter annealing it at about 250° C. for at least 48 hours.

3. The method of making a permanent magnet alloy containing about 4.7% aluminum, about 8.8% manganese and about 86.5% silver, which comprises heating the alloy at a temperature of at least about 800° C., quenching, cold reducing the alloy at least 50%, and thereafter annealing it at about 250° C. for at least 48 hours.

HAROLD T. FAUS.