UNITED STATES PATENT OFFICE.

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PERMANENT MAGNETIC METAL.

936,530. Specification of Letters Patent. **Patented Oct. 12, 1909.**

No Drawing. Application filed March 9, 1909. Serial No. 482,346.

To all whom it may concern:

Be it known that I, SAMUEL E. GERTLER, a citizen of the United States, and resident of New York city, borough of Manhattan, in the county of New York and State of New York, have invented certain new and useful Improvements in Permanent Magnetic Metals, of which the following is a specification.

This invention relates to the production of a metal or alloy which shall be useful as a permanent magnetic steel, particularly adapted to be used in or in connection with magnetos and other electrical instruments or machines of any description embodying permanent magnets.

The object of my invention is to produce a magnetic metal wherein the magnetic qualities will be increased to make them more permanent than in magnetic metals heretofore used and known to me, such as steel having superior permanent magnetic qualities whereby to increase the efficiency of electrical instruments, machines and other devices in which magnetic steel is used.

In carrying out my invention I produce an alloy comprising steel and aluminum melted together in proper proportions to produce the best permanent magnetic effects. Such steel may be what is commonly called tungsten steel or manganese steel, or steel containing both tungsten and manganese, with which the aluminum is incorporated. I find that 2.5% of aluminum incorporated by melting with the steel described produces a superior permanent magnetic metal. A suitable alloy may be made by melting together the following ingredients in substantially the following proportions: tungsten 5.25%, carbon .65%, silicon .15%, manganese .25%, chromium .20%, sulfur and phosphorus .02% or less, aluminum 2.50%, and the remainder iron, to make 100% in all. The proportions I have given are approximate, but may be varied as desired. The aluminum may be mixed with the steel in any manner well known to those skilled in the art, as for instance, the various ingredients above described may be melted together in a suitable crucible at one time, or added in a manner to enable the mixture to retain when completed the above approximate proportions.

A metal or steel produced in accordance with my invention will possess permanent magnetic qualities in high degree, which will be particularly useful in magnetos and also in other electrical instruments and machines.

Having now described my invention what I claim is:—

1. A permanent magnetic metal comprising tungsten steel and aluminum.

2. A permanent magnetic metal comprising tungsten steel and less than 5% of aluminum.

3. A permanent magnetic metal comprising tungsten, carbon, silicon, manganese, chromium, sulfur and phosphorus, and aluminum.

4. A permanent magnetic steel comprising tungsten 5.25%, carbon .65%, silicon .15%, manganese .25%, chromium .20%, sulfur and phosphorus .02% or less, aluminum 2.50%, and iron to an amount providing 100% in all.

Signed at New York city, in the county of New York, and State of New York, this 5th day of March, A. D. 1909.

SAMUEL E. GERTLER.

Witnesses:

JOHN SPLITDORF,

WILLIAM J. HART.