

# UNITED STATES PATENT OFFICE.

ROBERT A. HADFIELD, OF SHEFFIELD, ENGLAND.

## METHOD OF MAKING MAGNETIC MATERIALS.

No. 836,760.

Specification of Letters Patent.

Patented Nov. 27, 1906.

Application filed July 5, 1906. Serial No. 324,897.

*To all whom it may concern:*

Be it known that I, ROBERT ABBOTT HADFIELD, a subject of the King of Great Britain, residing at Sheffield, England, have invented a certain new and useful Improvement in Methods of Making Magnetic Materials, of which the following is a specification.

In United States Letters Patent No. 767,110, granted to me August 9, 1904, I have described and claimed a method of making magnetic material which consists in rolling an alloy of iron combined with other elements, more particularly silicon, aluminium, or phosphorus, into thin sheets and then subjecting said rolled sheets to a heat treatment of two steps. As the magnetic material referred to is cold-short, the rolling or forging of the alloy into thin sheets, as set forth in my patent aforesaid, necessarily implies a preliminary heating of said alloy to a high temperature in order to enable it to be thus mechanically treated, and hence the said alloy is really heated three times—that is to say, once before mechanical treatment and twice afterward.

In carrying my present process into effect I eliminate one of these subsequent heat treatments, or rather substitute for it the preliminary heating before mechanical treatment. Thus I first heat the material to, say, between 700° and 800° centigrade, then roll

it or otherwise mechanically reduce it to a thin sheet, then reheat to between 900° and 1,000° centigrade, and finally cool.

I claim—

1. The method of producing a magnetic material of high permeability and low hysteresis action, which consists in alloying a magnetic substance with silicon, heating said substance to a temperature below its melting-point, mechanically treating said substance to reduce it to a sheet, reheating said sheet to a temperature below its melting-point, and different from said first-named temperature, and finally cooling.

2. The method of producing a magnetic material of high permeability and low hysteresis action, which consists in alloying a magnetic substance with silicon, heating said substance to a temperature below its melting-point, mechanically treating said substance to reduce it to a sheet, reheating said sheet to a temperature below its melting-point but above said first-named temperature, and finally cooling.

In witness whereof I have signed my name hereto in the presence of two witnesses.

ROBERT A. HADFIELD.

Witnesses:

HENRY E. DIXON,  
FRANK HUTSON.