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UNITED STATES PATENT OFFICE.

RICHARD WALTER, OF DUSSELDORF, GERMANY.

ALLOY.

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To all whom it may concern:

Be it known that I, RICHARD WALTER, a citizen of the German Republic, and residing at Dusseldorf, Germany, have invented certain new and useful Improvements in Alloys, of which the following is a specification.

My invention refers to alloys adapted to resist the corrosive action of acids and more especially to alloys containing silicon.

As is well known to those skilled in the art, alloys containing a relatively high percentage of silicon owing to their being acid-proof are widely employed for the purposes of chemical manufacture. Now an alloy of this kind in order to answer all requirements should contain a silicon content within the limits of 8 and 20%. On the other hand such alloys are so hard and brittle that they can be machined only with the aid of carborundum discs, and obviously the brittleness of the material renders it unfit for many cases. Many attempts have been made to avoid these drawbacks but up till now they have, all of them, remained unsuccessful.

I have now ascertained that by adding boron to alloys containing a relatively high percentage of silicon the hardness and brittleness of the alloys is quite materially diminished without their power of resisting the action of acids being reduced thereby.

I have ascertained that the hardness of an alloy containing 15 per cent silicon and 85 per cent iron and which is so hard as to scratch glass, will be greatly reduced by the addition of as little as 0.01 per cent boron, while if 0.03 to 0.04 per cent boron are added, the material can easily be turned on the lathe, be bored and drilled, the structure of the alloy being much finer than before.

This is the more astonishing in view of the well known fact that for instance in the case of steel an addition of boron will greatly increase the hardness of the metal.

I claim:

1. As a new product of manufacture an acid-proof high-silicon alloy, containing an admixture of boron in effective amounts.

2. As a new product of manufacture, an acid-proof high-silicon alloy, containing an admixture of boron in effective amounts, but not over 0.04% of the total.

3. As a new article of manufacture, an acid-proof high-silicon alloy, containing an admixture of boron within the limits of 0.01 and 0.04%.

4. As a new article of manufacture, an acid-proof iron-silicon alloy having a high silicon content, containing an admixture of boron in effective amounts.

5. As a new article of manufacture, an acid-proof alloy having a silicon content within the limits of 8 and 20%, and a boron content of effective amount.

In testimony whereof I affix my signature.

RICHARD WALTER.