

UNITED STATES PATENT OFFICE.

FRANKLIN E. BLAKE, OF MATTOON, ILLINOIS.

IMPROVEMENT IN COMPOUNDS FOR HARDENING BAR-IRON.

Specification forming part of Letters Patent No. 125,009, dated March 26, 1872.

Specification describing certain Improvements in Case-Hardening and Steelifying Bar-Iron, invented by FRANKLIN E. BLAKE, of Mattoon, county of Coles and State of Illinois.

The object of my invention is the use of certain chemicals, so combined as to steelify and case-harden bar-iron at a very cheap and rapid rate. The iron, after it has been through this process, can be heated and forged and tempered the same as any bar-steel.

The following chemicals form the base of my improvement: Blue vitriol, oxalic acid, carbonate of ammonia, pure saltpeter, muriate of tin, (crystals,) equal parts.

Mode of Preparation.

Dissolve the chemicals in a (*q. s.*) sufficient quantity of ninety-six per cent. alcohol. After all is dissolved, put in pine sawdust, as much as the solution will hold without dripping. Then pack the iron to be steelified with the compound in an iron case made perfectly air-tight by luting with fire-clay. Then put the case into a furnace and keep it at a cherry-red about thirty minutes, for steelifying the iron, after which let it cool gradually. This compound can be used a number of times and produce good results.

For case-hardening bar-iron, use the same material and process; and while red hot plunge the iron into the following compound, as follows: Three gallons of strong alkali; one pound saltpeter (nitrate of potassa); and muriate of tin, one-quarter pound.

The sample of one-half-inch square iron that accompanies this specification and drawing was broken before it was converted into steel, and shows the fibrous grain at the end; and

after going through the steelifying process it was broken off at the other end, and shows that the fibrous nature has been changed to crystal, and the whole piece converted into steel, that can be worked the same as any other steel.

The sample piece of iron one-half inch thick and one and one-quarter inch wide shows the case-hardening; and we claim that bar-iron case-hardened by this process can be heated and worked the same as steel, and has this advantage over all other case-hardening with which we are acquainted—of being tempered in water the same as English or bar-steel, without the trouble of re-case-hardening. This is a great advantage over other modes of case-hardening, as other case-hardened work will spring and get out of shape. Again, iron case-hardened by this process will not have any blisters, and will be strengthened considerable, thus making my invention of vast public utility.

Claim.

I claim—

The compound herein described, with the privilege of varying the proportions of the ingredients named, so as always to produce the same results, substantially as or for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANKLIN E. BLAKE.

Witnesses:

J. P. SOUTHARD,
E. O. FRINK.