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METHOD OF HEAT TREATING STEEL

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This invention relates to methods of heat treating steel.

It pertains specifically to methods of quenching steel whereby poor grades of carbon steel may be converted into steel that is equivalent to the finest tool steel.

It is a matter of common knowledge that the softer grades of iron may be converted into steel of various degrees of hardness by the addition of molybdenum, nickel, tungsten, etc., under the proper conditions of temperature. Such processes however, are expensive to carry out and are employed only when it is desired to manufacture steel for use as cutting tools, etc.

I have found that low grades of carbon steel may be converted into steel that is the full equivalent of the more expensive grades of steel for certain purposes by a simple process that may be performed by anyone without the use of complicated apparatus.

It is, accordingly, the principal object of my invention to provide a method of treating the soft and inexpensive grades of steel whereby they are converted into a harder grade that is, for some purposes, equivalent to the finest tool steel without necessitating the addition of other ingredients to the steel.

Another object of my invention is to provide a method of increasing the hardness of steel that is simple and inexpensive to carry out.

Other objects of my invention will be apparent as the description proceeds.

As a first step in the carrying out of my process, I prepare a quenching bath of the following ingredients: refined petroleum, animal fat, sodium chloride, sodium phosphate, sodium bicarbonate and acid. The proportions of the ingredients may be varied somewhat, but I have found that a quenching bath made up as follows gives very good results.

Kerosene oil	gallons	5
Beef tallow	do	1
Common table salt	pounds	½
Sodium phosphate	drams	10
Sodium bicarbonate	do	10
Tartaric acid	do	5

If desired, two ounces of oil of coriander may be added to the bath as a deodorant.

The bath is made up by melting the tallow and adding the salt thereto. This mixture is then poured into the kerosene, in which the sodium phosphate and sodium bicarbonate have previously been dissolved. The mixture is then thoroughly stirred and, if thought desirable, the oil of coriander may then be added.

The steel to be treated is heated uniformly to approximately 1500° F. and is plunged into the bath in as quick a manner as possible and left there until cool.

The above described process has been found to be particularly effective in hardening such tools as chisels, axes and planer blades which are in common household and farm use, and which are usually made of the cheaper grades of carbon steel which loses its edge very quickly and requires frequent sharpening.

The ordinary hardware store variety of axes, planes, chisels, etc., when treated as outlined above, will retain their edges for long periods of time without resharpening, and will not become notched or pitted even when used to cut nails and wire. Because of the simplicity of my process, and because the ingredients required for my quenching bath are inexpensive and may be purchased everywhere, my process is capable of being carried out by the average blacksmith.

It is to be understood that I have described only one specific embodiment of my invention, which is to be taken as illustrative and not as limiting, except as defined in the following claims.

I claim:

1. The method of heat treating metals which comprises heating the metal to be treated to approximately 1500° F. and quickly plunging it into a bath composed of the following ingredients: 5 gallons kerosene oil, 1 gallon beef tallow, ½ pound common table salt, 10 drams sodium phosphate, 10 drams sodium bicarbonate and 5 drams tartaric acid.

2. The method of heat treating steel which comprises heating the metal to be treated to approximately 1500° F. and quenching it in a bath consisting of kerosene oil and beef tallow mixed together in quantity ratio of substantially 5 to 1 together with a relatively small quantity of common table salt, sodium phosphate, sodium bicarbonate and tartaric acid.

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