

UNITED STATES PATENT OFFICE.

BARNABAS J. CASTERLINE, OF PORTLAND, OREGON, ASSIGNOR TO CASTERLINE CUTLERY COMPANY, OF PORTLAND, OREGON, A CORPORATION.

PROCESS OF HARDENING AND TEMPERING STEEL.

No. 879,517.

Specification of Letters Patent.

Patented Feb. 18, 1908.

Application filed June 13, 1907. Serial No. 378,728.

To all whom it may concern:

Be it known that I, BARNABAS J. CASTERLINE, a citizen of the United States, and resident of Portland, county of Multnomah, and State of Oregon, have invented certain new and useful Improvements in Processes of Hardening and Tempering Steel, of which the following is a specification.

This invention relates to a process of hardening and tempering steel especially such articles composed of steel as drills, blades and all edged-tools. The objects of the invention being to prevent crystallization; to attain a maximum degree of hardness and a white, silvery appearance; to obviate the necessity of depending upon natural elements such as air and water, or upon quicksilver, sal ammoniac and alum; to produce a not only excessively hard, but exceedingly malleable product which has qualities of resistance enabling the same to be successfully employed as a means for cutting and drilling manganese steel or chromium steel; and to provide articles of the character named which embody elements of great durability. These objects are attained in my improved process by employing a solution of salt, saltpeter, wood alcohol, carbonate of iron, borax, glycerin and oil.

To temper and harden a given article of steel the same is first heated to a "cherry-red" heat, then immersed into the above named solution and kept submerged for the same length of time required to allow water to subside and discontinue bubbling when a piece of "cherry-red" heated steel is submerged therein; said period of time will be readily understood by those familiar with the art of tempering metals. After being allowed to cool in the solution for a period as stated above the article is coated with tallow and then heated slowly by holding it over a slow fire, until drawn to the degree of mallea-

bility required, the period of time being varied according to the uses for which the article being tempered is intended.

In the operation and use of my invention sharp-edged knives tempered by the said process may be readily employed to alternately cut chips from a steel bar and shave fine hair from the back of a human hand without perceptible dulling of the edge; drills so tempered may be employed for drilling holes through hard steel without in any perceptible manner impairing their cutting edges; edge tools of all character are made very durable and maintained in perfect working shape for a maximum length of time, and elongated cutting blades such as swords may be provided with exceedingly keen edges not susceptible of being dented or turned by contact with other blades, while at the same time the blade may embody the desirable degree of resiliency.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is:—

The hereinbefore described improvement in tempering and hardening steel, consisting of first heating the steel to a "cherry red" heat, then submerging and cooling the steel in a solution of salt, saltpeter, carbonate of iron, borax, wood alcohol, glycerin and oil; then coating the steel with tallow, and subjecting it to the action of a slow fire by holding it over the same, substantially as described.

In testimony that, I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this 24th day of May 1907.

BARNABAS J. CASTERLINE.

Witnesses:

W. JUNIS,
FRANK MOTTER.