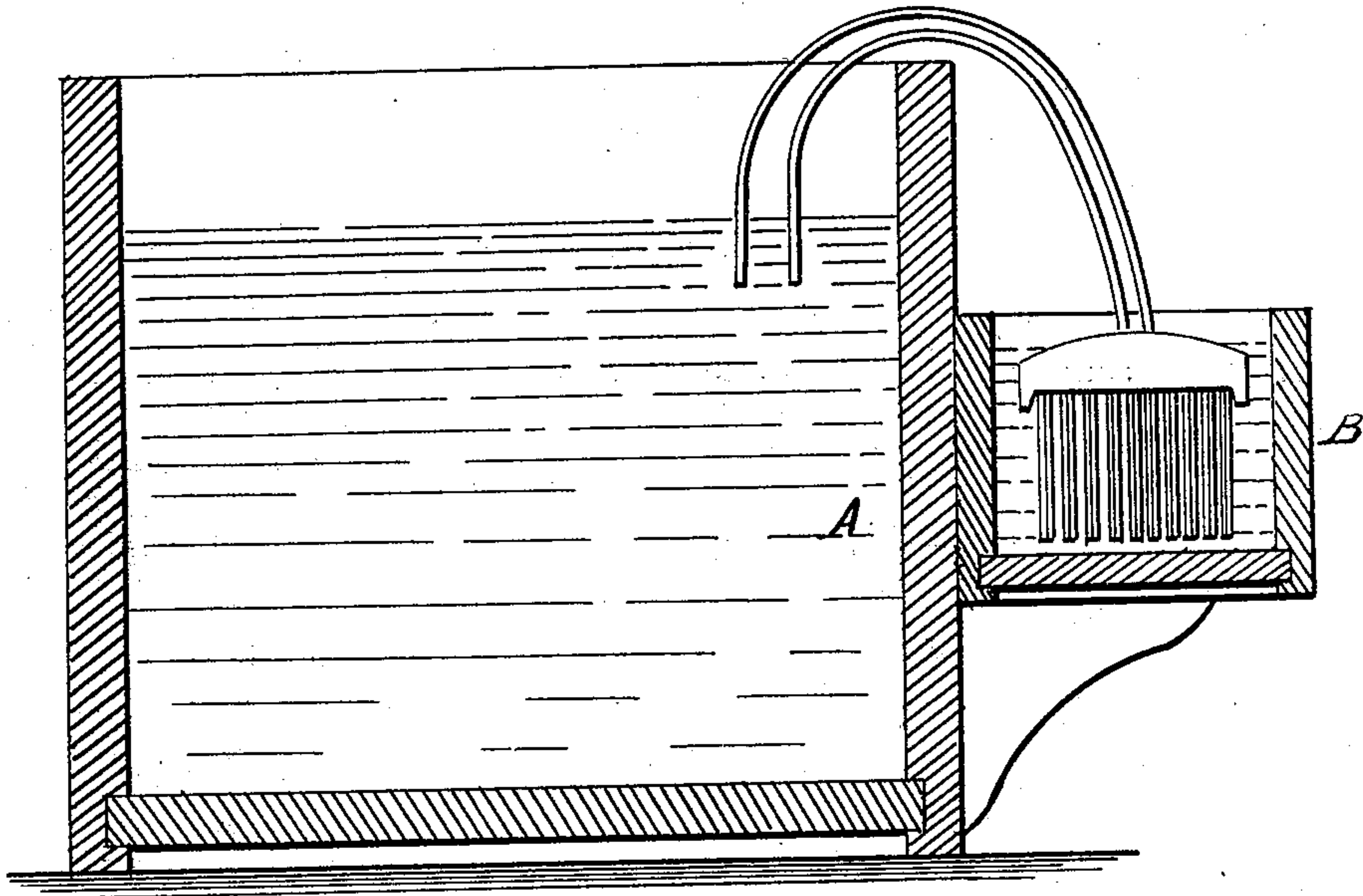


J. RUSSELL.

Process of Hardening Files.

No. 52,450.

Patented Feb. 6, 1866.



Witnesses

J. W. B. Covington
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UNITED STATES PATENT OFFICE.

JOHN RUSSELL, OF SING SING, NEW YORK.

IMPROVED PROCESS FOR HARDENING FILES.

Specification forming part of Letters Patent No. 52,450, dated February 6, 1866.

To all whom it may concern:

Be it known that I, JOHN RUSSELL, of Sing Sing, in the county of Westchester and State of New York, have invented a new and Improved Process for Hardening Files and other articles of Steel; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same.

The drawing represents a sectional side elevation of this invention.

This invention consists in passing a galvanic current through the solution in which files or other articles of steel are to be hardened in such a manner that by the action of said current the steel is rendered tougher, less liable to crack during the process of hardening, and when hardened according to this process the teeth or the cutting-edges of other tools are capable of sustaining heavier blows or doing more work than similar articles hardened in the ordinary manner.

In hardening files or other articles of steel the solution used in hardening is usually placed in a vat, A, of wood or any other suitable material, and the solution generally used is made of salt, saltpeter, and lime. On the side of this vat I place a galvanic battery, B, leading the wires from both poles of the same

into the solution in the vat A during the time the articles to be hardened are submerged in said solution. The effect of the galvanic current on the steel is of great advantage. The teeth of files hardened according to my process stand much better than those of files hardened in the ordinary manner, and when my process is applied to tools or other articles of steel the same advantage is obtained.

The solution which I use, by preference, is composed of water made twenty-two degrees strong with common salt, adding six pounds of saltpeter and one pound slaked lime to thirty gallons of water. The bath ought to be lined with lead for the purpose of passing in the current of electricity to the vat.

What I claim as new, and desire to secure by Letters Patent, is—

Passing a galvanic current through or into the solution in which files or other articles of steel are to be hardened, substantially as and for the purpose described.

The above specification of my invention signed by me this 24th day of October, 1865.

JOHN RUSSELL.

Witnesses:

M. M. LIVINGSTON,
C. L. TOPLIFF.