A. LÜTTGES.

Apparatus for Hardening and Tempering Sheet-Steel

No. 198,804. Patented Jan. 1, 1878.

Fig. 1.

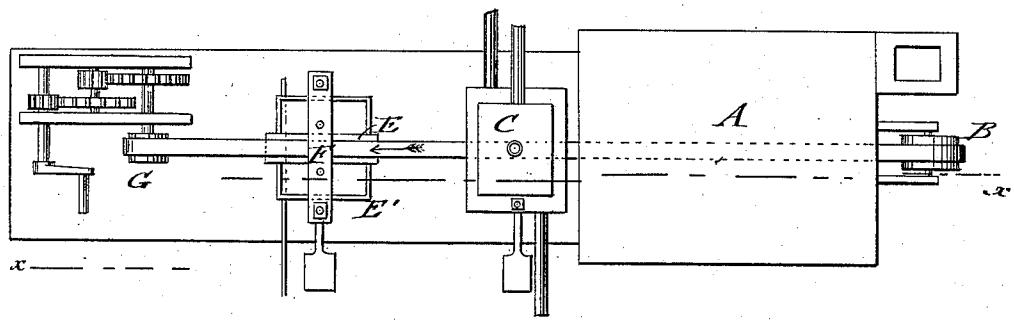


Fig. 2.

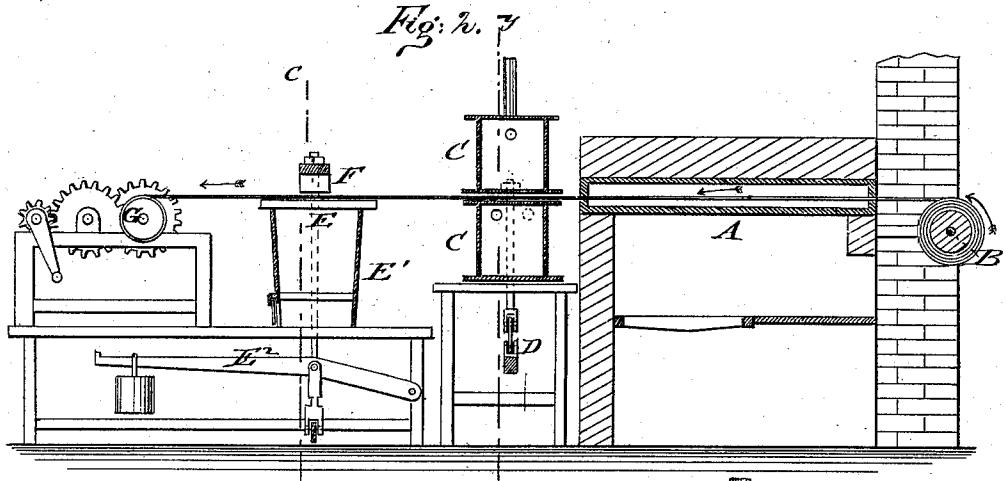


Fig. 4.

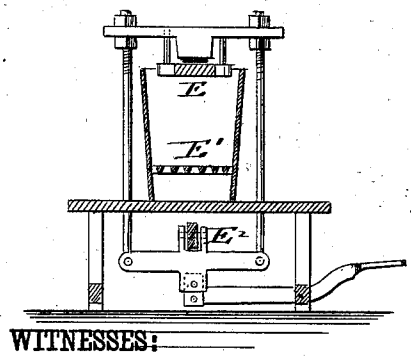
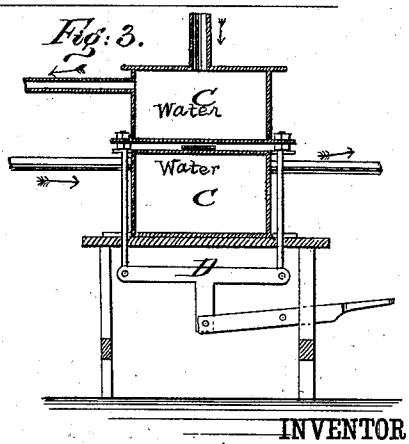


Fig. 3.



WITNESSES:

Chas. Noble

J. H. Scarborough

INVENTOR:

A. Lüttges.

BY Munn & Co

ATTORNEYS.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ALBERT LÜTTGES, OF SOLINGEN, PRUSSIA, GERMANY.

IMPROVEMENT IN APPARATUS FOR HARDENING AND TEMPERING SHEET-STEEL.

Specification forming part of Letters Patent No. **198,804**, dated January 1, 1878; application filed September 29, 1877.

To all whom it may concern:

Be it known that I, ALBERT LÜTTGES, of Solingen, in the Kingdom of Prussia and Empire of Germany, have invented a new and improved Apparatus for Hardening and Tempering Sheet-Steel, of which the following is a specification:

In the accompanying drawings, Figure 1 represents a top view; Fig. 2, a vertical longitudinal section on line *x x*, Fig. 1; and Figs. 3 and 4 are vertical transverse sections, respectively, on lines *y y* and *c c*, Fig. 2, of my improved apparatus for hardening and tempering sheet-steel.

Similar letters of reference indicate corresponding parts.

The invention consists of an apparatus for the purpose of conducting, first, the sheet-steel through a heating-oven; then hardening the same between cooling-vessels, that are pressed thereon with more or less power; and, finally, tempering the sheet-steel by passing it between the bridge of a box heated by charcoal or otherwise and a block pressing thereon.

Referring to the drawings, A represents an oven, that is heated up by a fire below the same, and through which the sheet-steel is conducted by means of end openings, the steel having been previously rolled up on a drum, B.

The sheet-steel is thoroughly heated in the oven, and then passed through between a fixed and a movable chilling-vessel, C, arranged near the exit-openings of the oven, the vessels being kept cool by a continuous flow of cold water.

The water-supply is kept up by means of entrance and discharge pipes, and by the chilling action of the cold vessels a suitable flat hardening imparted to the steel.

The upper movable reservoir C is connected to a treadle and weighted lever, E^2, by which the pressure of the reservoir on the steel may be regulated at will. The sheet-steel is then conducted over an iron bridge, E, of a cast-iron box, E^1, heated by burning coke or charcoal, or in other suitable manner.

The temper of the steel is drawn by its passage between the heated plates. The sheet-steel is exposed to the pressure of a weighted lever, E^2, that is connected to a top block, F, which exerts a greater or less pressure on the sheet-steel during its passage over the bridge.

The tempered steel is wound up on a drum, G, that is turned by suitable crank and gearing. At the beginning of the operation the end of the sheet-steel is drawn through the apparatus by a chain attached thereto, the hardening and tempering being continued in regular manner after the end is drawn through the oven hardening and tempering devices.

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

In an apparatus for hardening and tempering steel, the combination of a heated tempering-box, having a top guide-bridge, with a pressure-block and weighted lever connected thereto, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 25th day of June, 1877.

ALB. LÜTTGES.

Witnesses:

OTTO HESSMER,

CARL WOLFERTS.