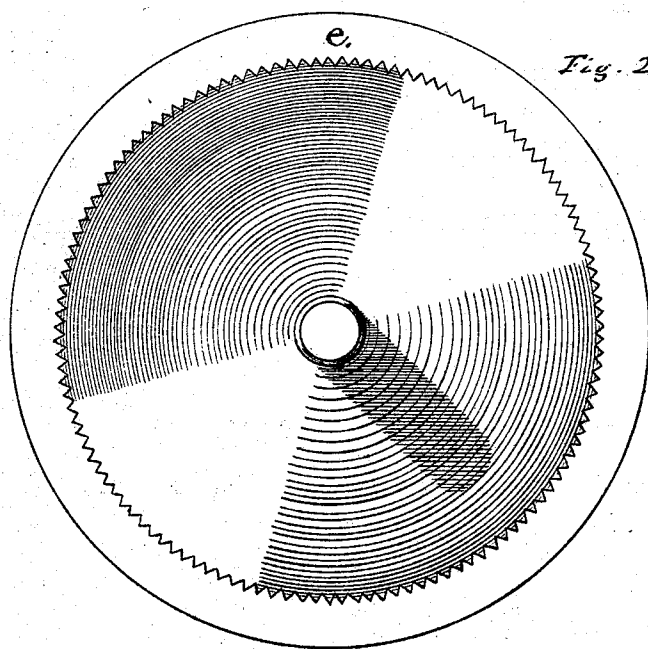
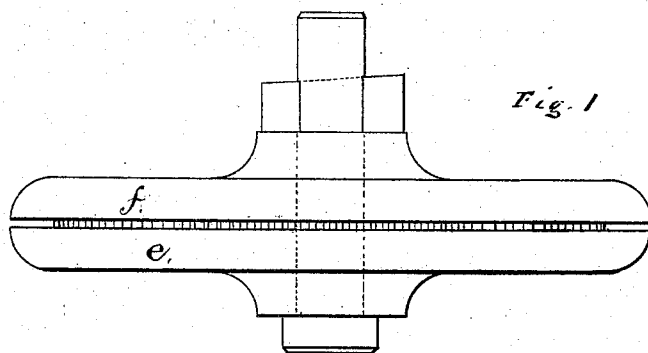


G. F. SIMONDS & J. A. FERSON.

Tempering and Forming Articles of Steel.

No. 150,625.

Patented May 5, 1874.



Witnesses.

W. R. Edelen
Geo. T. Smallwood Jr.

Inventors,
George F. Simonds.
James A. Ferson.
per
J. H. Halsted, Atty

UNITED STATES PATENT OFFICE.

GEORGE F. SIMONDS AND JAMES A. FERSON, OF FITCHBURG, MASSACHUSETTS, ASSIGNORS TO SIMONDS MANUFACTURING COMPANY, OF SAME PLACE.

IMPROVEMENT IN TEMPERING AND FORMING ARTICLES OF STEEL.

Specification forming part of Letters Patent No. 150,625, dated May 5, 1874; application filed April 7, 1874.

To all whom it may concern:

Be it known that we, GEORGE F. SIMONDS and JAMES A. FERSON, both of Fitchburg, in the county of Worcester and State of Massachusetts, have invented an Improvement in Tempering; and we do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of our invention sufficient to enable those skilled in the art to practice it.

Our invention relates to the hardening, tempering, and bringing to their ultimate forms, articles of steel, or of steel and iron combined; and it consists in the process hereinafter stated and explained.

In our process we heat the articles for hardening in the usual manner, and after hardening we again heat in order to temper. When at a proper heat we compress the metal in a clamp constructed for the purpose, as represented in Fig. 1, in which opposite compressing surfaces are either straight or shaped to suit the ultimate form required in the article to be produced.

Up to this point our process is common and well known, the same having been frequently practiced in the efforts heretofore made to temper and straighten saws after they have been hardened. It is well known in the mechanical and manufacturing circles that none of these efforts have been fully successful. The saws when taken from the clamps still required hammering to a greater or less extent, which adds materially to the cost of the article produced.

The object of our invention is to overcome the difficulty heretofore experienced in producing a perfect saw; and to accomplish this we ascertained by experiments in what the difficulty consisted, and in this consists essentially our invention or discovery.

During the process of tempering we found it was necessary to avail ourselves of the greatest ultimate heat allowable in producing a

spring temper, and having reached this point we maintain the heat and compression a sufficient time—say, about thirty minutes, more or less—to allow the particles of metal to assume an easy relation to each other, and thus prevent the twisting or warping of the saw when released from the clamp. Another condition of success is the perfect evenness of heat from the time one part of the process begins until it ends. The proper degree of heat, as well as its required regularity, may be easily determined in a dark room, where the clamps will show the same regular, dull-red color throughout, any irregularity of heat readily showing itself, or it may be determined by sprinkling sawdust over the entire clamp. If the sawdust burns with a quick, bright sparkle evenly over the entire surface, the process is completed and the saw or other article may be safely removed from the clamps without fear of its twisting or warping.

We have found in practice that in some cases the article may be taken from the bath and immediately clamped and pressed, the heating and tempering being performed as we have described.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

The process herein described for tempering and bringing hardened articles of steel, or steel combined with iron, to any required form by clamping them between plates or forms, and heating to that uniform temperature which is consistent with the required temper, and keeping them at that heat for the length of time required for the particles or atoms to fully adjust themselves, thus leaving the article in the required form.

Executed this 13th day of March, A. D. 1874.

GEORGE F. SIMONDS.

Witnesses: JAMES A. FERSON.

ALFRED HITCHCOCK,

ALVAN A. SIMONDS.