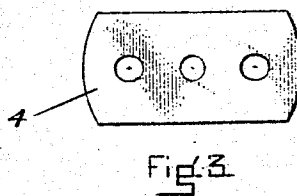
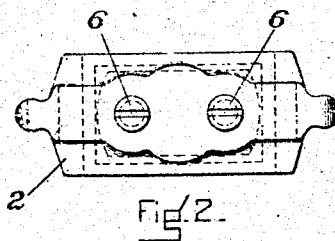
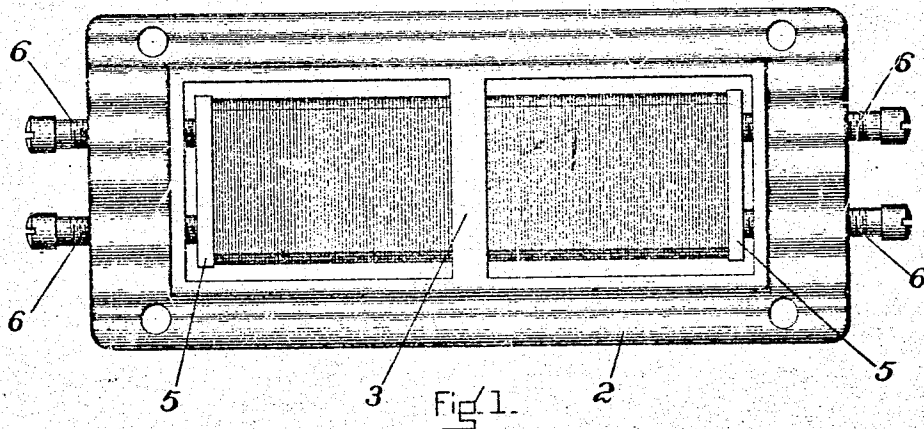


W. E. NICKERSON.
METHOD OF TEMPERING.
APPLICATION FILED FEB. 9, 1906.

971,628.

Patented Oct. 4, 1910.



WITNESSES:
Joseph T. Brennan
Margaret H. Davis

INVENTOR:
Wm E. Nickerson
By E. S. Chadwick
Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM E. NICKERSON, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR TO GILLETTE SAFETY RAZOR COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

METHOD OF TEMPERING.

971,628.

Specification of Letters Patent.

Patented Oct. 4, 1910.

Original application filed September 26, 1903, Serial No. 174,739. Divided and this application filed February 9, 1906. Serial No. 300,231.

To all whom it may concern:

Be it known that I, WILLIAM E. NICKERSON, a citizen of the United States, and resident of Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Method of Tempering, of which the following is a specification.

This invention relates to the art of tempering steel, and is particularly applicable to the tempering of thin sheet steel articles such as the blades employed in the safety razor shown and described in U. S. Letters Patent, No. 775,134, granted on the 15th day of November, 1904, on the application of King C. Gillette, this application being a division of my prior application, Serial No. 174,739, filed September 26, 1903, in which a method of hardening said blades and similar articles is described and claimed. In hardening these blades it will occasionally happen that they will be slightly rim-bound or dished when cold, and drawing the temper of such blades in the ordinary way will have no effect on this dishing. I have discovered, however, that blades thus deformed can be restored to their original flatness by confining them compactly between flat plates or abutments and drawing their temper in a hot bath while so confined, and I have also found that the flatness of blades which have not been deformed by the hardening process can be preserved by tempering them in the same way. In practice, I temper a number of blades simultaneously by stacking them one upon another. When the temper of such blades or other articles is drawn in this manner, the heat has to pass into and out of the blades mainly through the exposed edges of the latter, and the results secured appear to be due to this fact and to the further fact that the blades are compactly confined under pressure and between end plates or abutments, so that when the molecular strains are removed or diminished by the heating operation the tendency is for the blades to become or remain flat, and when they are again cooled they must do so without distortion.

In the accompanying drawings, I have illustrated an apparatus useful in practicing my method, in which drawings:—

Figure 1 is a front elevation of a frame containing two stacks of articles to be tem-

pered; Fig. 2 is a top plan view of the same; and Fig. 3 is a plan view of one of the blades above referred to.

Referring to the drawings, 2 represents a frame, preferably made of iron or steel, which is shown as consisting of a rectangular rim inclosing two open spaces separated by a transverse partition 3.

4 represents a thin sheet metal blade such as is shown and described in the Letters Patent above referred to, 5—5 represent removable end plates which are preferably a little longer and wider than said blades and are enough thicker than the latter to be rigid to pressure, and 6—6 represent clamping screws passing through the end portions of the frame 2, in position to bear upon the corresponding end plates.

In practicing my method with this apparatus, the open spaces in the frame 2 are each filled with a stack of hardened blades 4 or similar articles, each stack being surmounted at the corresponding end of the frame by one of the plates 5 and bearing at its other end on the flat inner face of the partition 3, which should be at least as long and as wide as the blades. Each stack is thereupon compacted by pressure applied to the corresponding plate 5 through its clamping screws 6, and the frame with the contained stacks of blades is then suspended in a tempering bath or otherwise exposed to heat and thereby subjected to the proper temperature for a suitable length of time, according to the temper required. After the operation has been completed the clamping screws are unscrewed and the blades are removed and separated.

Any other suitable apparatus may be employed instead of the one above described.

My method of tempering above described is useful not only on account of its efficiency in preserving or restoring the flatness of the articles tempered, but also because it provides, if desired, for tempering a large number of such articles simultaneously and therefore quickly and economically, as will be evident. It will also be evident that a thin steel article need not necessarily be flat or intended to be flat in order to be capable of being tempered according to my method, it being requisite merely that the end plates or abutments shall conform to the desired shape of the article.

I claim as my invention:

1. The herein described method of temper-
ing thin articles of hardened steel, which
consists in placing said hardened articles one
5 directly upon another to form a stack, con-
fining them under pressure, and drawing the
temper thereof by immersing said stack in a
hot bath.
2. The herein described method of temper-
10 ing thin steel articles, which consists in
heating said articles and hardening the same,
placing said hardened articles one directly
upon another to form a stack and confining
the same under pressure, and drawing the
15 temper thereof by immersing said stack in
a hot bath.
3. The herein described method of temper-
ing thin articles of hardened steel, which
consists in placing said hardened articles
20 one directly upon another to form a stack,

confining the stack under pressure between
rigid protecting surfaces which conform in
contour to the articles when tempered, and
subjecting said stack to heat.

4. The herein described method of temper- 25
ing thin articles of hardened steel, which
consists in placing said hardened articles one
directly upon another to form a stack, con-
fining the stack under pressure between rigid
protecting surfaces which conform in con- 30
tour to the articles when tempered, and im-
mersing said stack in a hot bath.

In testimony whereof, I have hereunto
subscribed my name this seventh day of Feb-
ruary, 1906.

WILLIAM E. NICKERSON.

Witnesses:

E. D. CHADWICK,
JOSEPH T. BRENNAN.