H. WATERS.

Machine for Rolling Metal.

No. 47,590. Patented May 2, 1865.

Fig. 1.

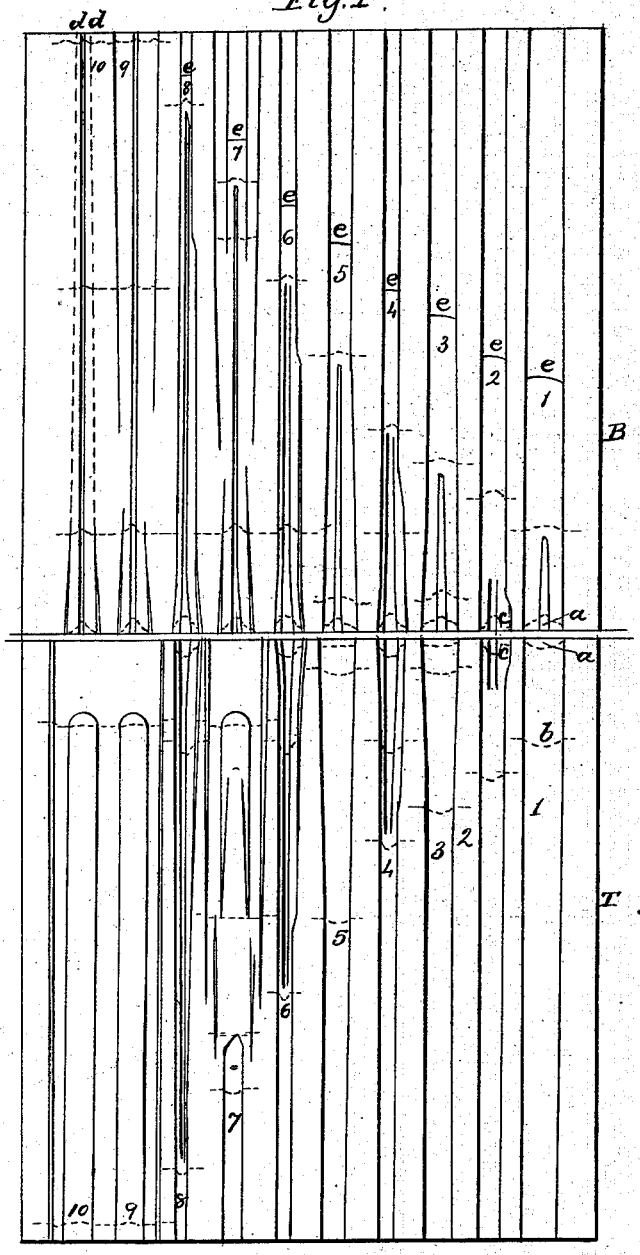
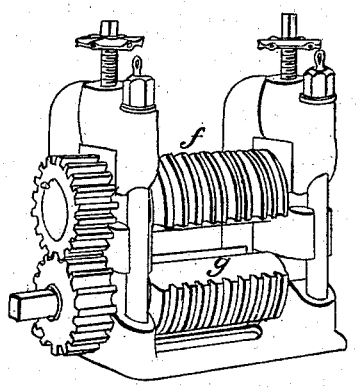


Fig. 2.



Witnesses:

Inventor:
Henry Waters

UNITED STATES PATENT OFFICE.

HERVEY WATERS, OF NORTHBRIDGE, MASSACHUSETTS.

MACHINE FOR ROLLING METAL.

Specification forming part of Letters Patent No. **47,590**, dated May 2, 1865.

To all whom it may concern:

Be it known that I, HERVEY WATERS, of Northbridge, county of Worcester, and State of Massachusetts, have invented Improved Roller-Grooves; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention, sufficient to enable those skilled in the art to practice it.

My invention is applicable to the rolling of bayonet-blades, file-blanks, and other similar articles; but to enable it to be the more clearly understood, I will particularly describe its adaptation to the manufacture of bayonet-blades, to produce bayonet-blades by rolling directly from pieces cut from the merchant-bar, whereby great saving of labor and material, and greater accuracy in the forged state, are obtained, and at the same time to have the material in much better condition, being the primary objects of my invention.

Prior to my invention the practice was, as far as I know, to first produce, by drawing from the merchant-bar, blanks from which blades were afterward formed by swaging with a hammer, or by swaging with rolling-dies. When the blank was formed for swaging with a hammer, it was drawn nearly to the length of the intended blade; but when formed for swaging with the rolling-dies the blank was left shorter, but both blanks were in form of truncated pyramids, having their cross-sections square throughout.

United States Letters Patent No. 43,247, dated June 21, 1864, were granted to me for an improved bayonet-blank.

By my present invention I have succeeded in rolling bayonet-blades directly from such improved bayonet-blanks at a single heat, and in ten to twelve seconds of time each, from which blades better bayonets have been produced than ever before. In my bayonet-blanks (from which some three hundred thousand of these blades have been thus produced by me) all that part of each blank from which the blade was produced was, previous to rolling, in its normal condition as to form—that is to say, the form of such part of each blank as presented to the action of the two grooves constituting the "first pass" is unchanged from the form it possessed in the merchant-bar from which the blank was cut.

My invention consists in a peculiar system or suit of drawing and shaping grooves (modeled in a pair of rolls) for rolling bayonet-blades and similar articles.

The grooves of the suit have terminations which are concentric, or nearly so, toward their small ends, which is found to be much more simple and practical than when the taper holds throughout the length of the working-grooves. Of course the finishing-passes will always have eccentric grooves throughout if the work calls for it; but for the purposes of the most rapid drawing the concentric terminations are preferable.

For a better understanding of this system of grooves, reference may be had to Figure 1 of the drawings, which represents the cylindrical working-surfaces of the two rolls reduced to a horizontal plane. B represents the bottom roll and T the top roll, the figures 1 1 denoting the two grooves working in conjunction for the first pass, figures 2 2 the grooves for the second pass, and so on up to the figures 9 9, which represent the finishing-pass for forming a bayonet-blade. 10 10 shows another finishing-pass for the same purpose as 9 9, to be used in some cases, as will be hereinafter explained.

The dotted lines at *a a* in the first pass show in section, respectively, the form and depth of the groove from the surface of the roll at the heel of the pass when the work is first seized by the rolls, and at *b b* is represented by dotted lines the forms in section of the grooves at about the point indicated, and which they hold to the end of the groove. *c c* show, respectively, a section of the second pass, and so on through the series, the dotted lines everywhere indicating sectional forms of the grooves at about the points where such lines are located; but in the tenth groove of the bottom roll the dotted lines *d d* represent the outlines of the edges of a bayonet-blade. The full lines *e e*, &c., represent the points to about which a blank would reach when drawn in this system of grooves in its progress from groove to groove; and it will be observed that in all cases the points reach beyond the dotted lines where the grooves are always concentric, the concentric termination getting shorter and shorter as the work progresses, while the approximate form gets longer and longer, so that at the same time that that part toward

the point is being rapidly reduced in size the other part is being perfected in form—the finished form running the entire length of the blade in the finishing-pass 9 9. As a matter of economy, it is found useful to use two finishing-passes in a suit of grooves for rolling bayonet-blades, it being desirable to give a more perfect finish at the last pass than at the preparatory passes of the work. When the grooves are new, the blade is finished entirely at the ninth pass of this system of grooves, but as this pass becomes rough from use, the work is finished in the tenth groove, going from the eighth groove to the tenth groove, skipping over the ninth groove.

For practicing this invention, a pair of rolls may be used similar to those represented at *f g*, Fig. 2, in the full surfaces of which these grooves may be constructed in any convenient manner; but I prefer to use chilled cast-iron rolls, in the solid surfaces of which this system of grooves may be modeled by means of a lathe of peculiar construction and mode of operation. This lathe was originally contrived, built, and used by me in modeling the rolls of my plating-mill for scythes, and will be described in an application which I intend to make for Letters Patent for the same in connection with that manufacture as soon as practical; but in addition thereto there are some appurtenances which have been contrived especially for the modeling of bayonet-grooves which I suppose to be novel and know to be highly useful, and which will be described in an application which I intend to make in connection with this last-named subject as soon as practical.

For presenting the piece to the action of the rolls, tongs may be used, the operator placing the piece directly in the grooves of the lower roll, and gaging directly from the forward corner of the same roll, as heretofore practiced; but there are other modes for presenting and gaging the blank to the grooves which I use and prefer, and which I have contrived partly in connection with the scythe manufacture and partly in this connection, and for which I intend to ask patents as soon as practical.

What I claim is—

A system of grooves for drawing and shaping, substantially as and for the purposes specified.

HERVEY WATERS.

Witnesses:

J. B. CROSBY,

FRANCIS GOULD.