

Machine for Tempering Saws, Files, &c.

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UNITED STATES PATENT OFFICE.

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IMPROVED MACHINE FOR TEMPERING FILES, SAWS, &c.

Specification forming part of Letters Patent No. 49,451, dated August 15, 1865.

To all whom it may concern:

Be it known that I, JOHN SMALL, of St. Louis, in the county of St. Louis and State of Missouri, have invented a new and Improved Machine for Tempering Saws, Files, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a top view of the tempering-machine. Fig. 2 is a longitudinal section taken in the vertical plane indicated by the red line *x x* in Fig. 4. Fig. 3 is a longitudinal section taken in the vertical plane indicated by the red line *y y*, Fig. 4. Fig. 4 is a vertical transverse section through Fig. 1, taken at the point indicated by red line *z z*.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to machinery for clamping plates of steel and preventing the plates from warping during the process of tempering them.

The invention consists in the use of perforated and ribbed jaws, between which the plates which are to be tempered are confined, one of said jaws being adjustable and susceptible of being moved up to or from the other, as will be hereinafter described.

The invention also consists in the employment of adjustable hooks, in conjunction with clamping-jaws, for the purpose of drawing the plates which are to be tempered down between the said jaws and holding them during the process of tempering, as will be hereinafter described.

The invention finally consists in providing for adjusting one of the clamping-jaws to plates which are tapering, as well as to plates which are flat on both sides, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A represents a rectangular bath-tub, which is adapted for containing oil or such ingredient as may be desired in the process of tempering. This tub may be made of any desired capacity, and mounted upon legs B B, which support the tub at such height as will be convenient for persons to work at it. Within this tub, and on

one side of the same, are two jaws, C C', which are set upright, and which extend nearly from one end of the tub to the other. The jaw C is secured rigidly to one of the vertical sides of the tub, so that oil can circulate all around it, and the jaw C' is secured to vertical strips *a a*, through the ends of which screw-rods *b b b'* are tapped, as shown in Figs. 1 and 3. The jaw C' is about the same size as the jaw C, and it is supported and adjusted by the four horizontal transverse screw-rods *b b'*, which are passed through one side of the tub A and furnished on their outer ends with pinion spur-wheels *c c*, all of which are of a uniform diameter.

The rods *b b'* are supported near their inner ends upon a longitudinal bar, Δ' , and these rods are so applied to the tub that they can have no end-play. Consequently when these rods are all turned by the large spur-wheel *d*, which engages with the pinions *c c*, the jaw C' will be moved either toward the jaw C or from it, according to the direction in which the wheel *d* is rotated.

The jaws C C' are constructed with ribs *e* on their opposite faces, which leave wide channels between them. These ribs should be made very narrow and extended from top to bottom of each jaw. They project from the face of the jaws sufficiently far to admit of their being planed level and still leave wide channels between them for the free circulation of oil between the jaws and the article confined between them.

In order to admit of a more free circulation of the oil between the jaws C C', I perforate these plates between the ribs *e e*, as shown in Figs. 2 and 3, so that cold oil will flow directly upon the hot steel plates.

The ribs of one plate or jaw may be arranged so as to be opposite the spaces between the ribs of the opposite plate, or these ribs may be arranged nearly opposite each other. They may be formed with rounded edges, or they may be made flat or acute, according to circumstances. I prefer to make these ribs very narrow, so that they will cover but a very small proportion of the surface of the plate which is confined between them.

The upper edge of the movable jaw may be curved backward, as shown in Fig. 4, for the purpose of guiding the article to be tempered

down between the clamping-surfaces. In the ribbed face of the stationary jaw C, I form vertical dovetail grooves, and insert into these grooves the rods *g g g*, which have hooks on their upper ends, as shown in Figs. 1, 2, and 4. These hooked rods pass down through the bottom of the tub A, and are secured at their lower ends to a horizontal rod, J, the ends of which pass through vertical slots which are made through the legs B B, as shown in Figs. 2 and 4.

To the outer ends of the rod J cords *h h* are attached, which cords pass tightly around the pulleys *k l* at each end of the tub. The pulleys *l l* are keyed on a crank-rod, K, which extends across the top of the tub, as shown in Figs. 1, 2, and 4. By turning the hand-crank of the rod K the hooked rods *g g g* can be moved up or down, and when desired their hooks can be brought between the two clamping-jaws C C'. These hooked rods *g g g* are for the purpose of forcibly drawing down the plates to be tempered and holding these plates between the clamping-jaws during the tempering or cooling operation. The hooks carry the plates beneath the surface of the bath, when the jaws C C' are very close to each other.

For tempering saws and blades or plates which are flat on both sides and of a uniform thickness the two jaws should be parallel to each other and their ribs planed very true. In such cases the large spur-wheel *d* is used for turning the screw-rods simultaneously, and thus moving the jaw C' squarely up to the jaw C.

Where it is desired to temper knife-blades or plates which are chamfered the large wheel *d* is removed and the jaw C' moved up to the jaw C in an inclined plane, according to the bevel of the blade to be confined and tempered.

For tempering bellied files I employ jaws the ribs of which are dressed to conform to the

shape of such files, so that every part of the file will be firmly held by said ribs.

It is important to brace the movable jaw C' to prevent it from yielding during the process of tempering large plates, and for this purpose the screw-rods *b b' b'* are made to answer the purpose by arranging them at proper distances apart.

The openings which are made through the bath-tub for the passage of the several rods should be provided with stuffing-boxes or their equivalents to prevent the tub from leaking.

I am aware that patents have been granted to Charles W. Filmore, January 10, 1854, to C. P. Crossman, July 28, 1857, and to Wm. Clemson, August 21, 1860, on machines for tempering different articles; but the construction of these machines differs from mine to a very great extent.

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

1. The arrangement of the vertical perforated jaws C C', which are constructed with narrow ribs or elevations upon their surfaces, in combination with the bath-tub A and the adjusting devices of one of the jaws, substantially in the manner and for the purposes herein described.

2. The construction, arrangement, and operation of the adjustable hooks *g g*, in combination with the jaws C C', substantially in the manner and for the purposes described.

3. The arrangement of the adjusting and bracing rods *b b'* with the jaws C C', hooks *g g*, bath-tub A, and inner support, A', substantially in the manner and for the purposes described.

JOHN SMALL.

Witnesses:

GOTTLIEB STOSBERG,
ALBERT STOSBERG.