(No Model.) 2 Sheets—Sheet 1.

G. F. SIMONDS & L. BLAKE.

SAW SWAGING MACHINE.

No. 328,528. Patented Oct. 20, 1885.

Fig. 1.

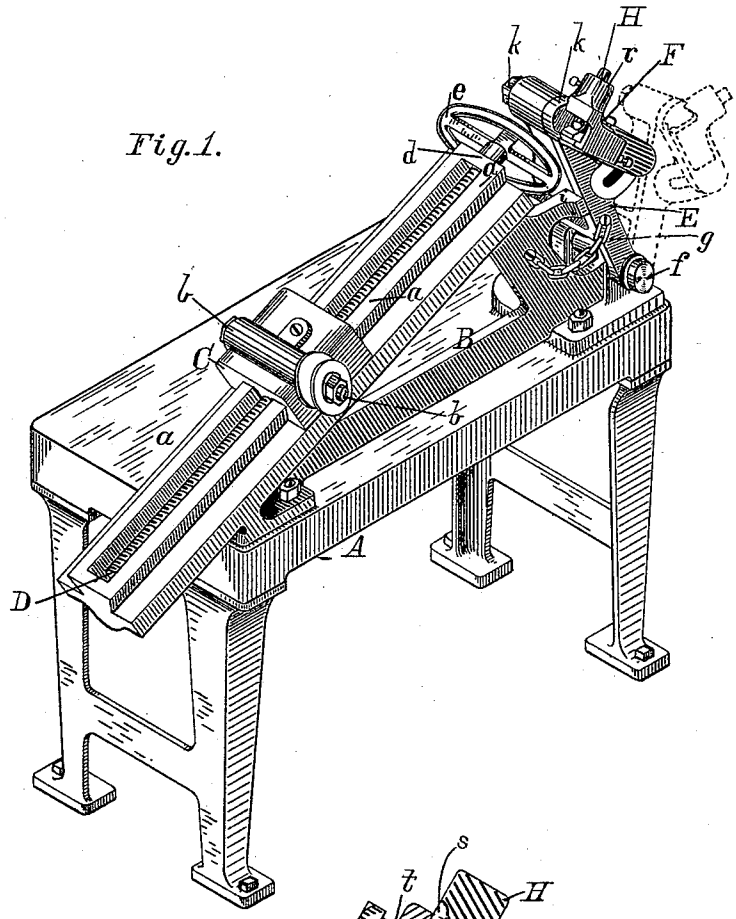
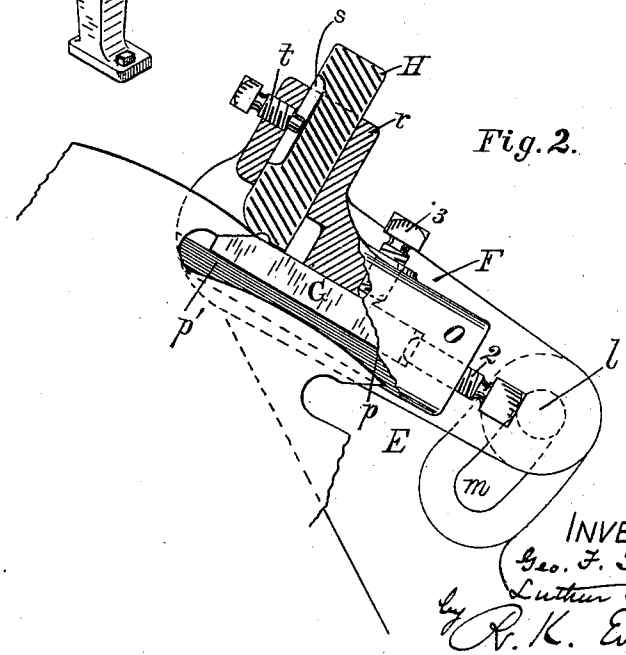


Fig. 2.



WITNESSES:
H. S. Downe
H. C. Hastings

INVENTORS
Geo. F. Simonds
Luther Blake
by R. K. Evans
atty.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

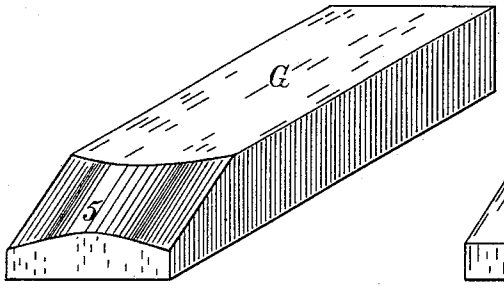


Fig. 4.

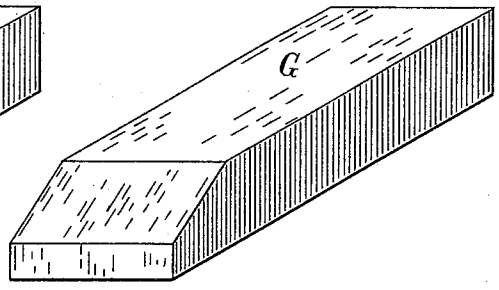


Fig. 5.

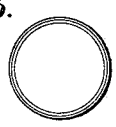


Fig. 6.

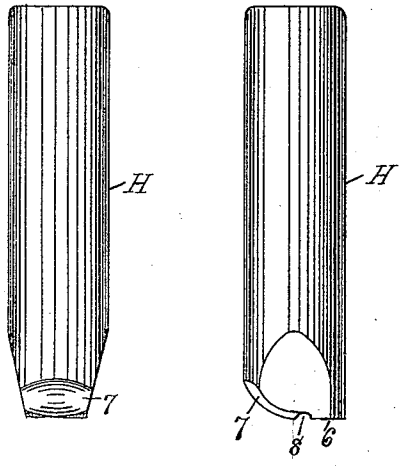


Fig. 7.

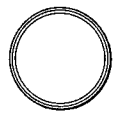
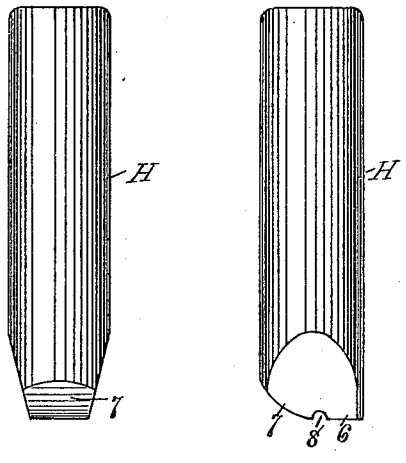


Fig. 8.



WITNESSES.

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Atty.

UNITED STATES PATENT OFFICE.

GEORGE F. SIMONDS AND LUTHER BLAKE, OF FITCHBURG, MASSACHUSETTS.

SAW-SWAGING MACHINE.

SPECIFICATION forming part of Letters Patent No. 323,528, dated October 20, 1885.

Application filed June 17, 1885. Serial No. 168,972. (No model.)

To all whom it may concern:

Be it known that we, GEORGE F. SIMONDS and LUTHER BLAKE, both of Fitchburg, in the county of Worcester and State of Massachusetts, have invented a new and Improved Swaging-Machine for Saws; and we hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of our improved swaging-machine. Fig. 2 is a side elevation, partially in section, of the devices designed to directly operate on the saw-teeth. Figs. 3 and 4 are views of the anvils used. Figs. 5, 6, 7, and 8 are views of forms of plungers to deliver the blows to the tooth.

Our invention relates to machines for swaging saw-teeth; and has for its object to provide an adjustable swaging device whereby the points of the saw-teeth may be spread or drawn out gradually with a minimum liability of splintering or splitting the points, and in a manner to leave the metal by condensation in the best possible condition for the work it has to do.

Our invention also has for its object the securing of points spread equally in front and back with good substantial shoulders, the repairing of individual corners or points of teeth without reducing the diameter of the saw, and at all times keeping the saw round and in balance.

To this end our invention consists in a diagonally-adjustable arbor for supporting the saw, in combination with an adjustable head provided with a loose plunger and a stationary anvil.

Our invention also consists of a fixed anvil to rest beneath the point of the tooth, in combination with a loose plunger adapted to transmit the blows of a hammer to the top of the point.

Our invention further consists in the peculiar shapes and forms of said plunger and anvil, as will be hereinafter fully described, and specifically pointed out in the claims.

Our invention also consists in providing an anvil having the die at the end of the bar, whereby the die-face is easily renewed by grinding or otherwise.

Nothwithstanding the great variety of saw-swages on the market; the draw-swage and hammer is more universally used than all others combined. Our invention utilizes the general principles of the saw-swage and hammer, and combines them in a machine that is simple, effective, and durable.

In order that those skilled in the art may make and use our invention, we will now proceed to describe the exact manner in which we have carried it out.

In the said drawings, A is a table of convenient size, supported in any desirable way to sustain the working parts of the machine. Bolted or otherwise secured to the top of the table is a triangular casting, B, the top of which bears diagonal ways *a a*, on which slides a saddle, C, carrying an arbor, *b*, and securing nuts and collars for supporting the saw while the teeth are being swaged. The sliding saddle C is tapped to receive an endless screw, D, having a bearing at *d*, and provided with a hand-wheel, *e*, to turn said screw and move the saddle C and its accompanying arbor, *b*, up and down ways *a a*, and thereby provide for varying sizes of saws being swaged. Adjacent to the upper end of the diagonal ways there is a swinging head, E, pivoted to the casting B at *f*, and having a movement from the casting limited by chain *g*, and when thrown against the casting it rests against a head, *i*, giving it a solid bearing to sustain the anvil, as hereinafter set out.

Pivoted through the upper end of head E, at *k*, is an adjustable anvil and plunger-holder, F, the rear end of which is provided with a bolt-hole, *l*, into which fits a headed bolt (not shown) passing through a curved slot, *m*, in head E, whereby the holder F can be adjusted or changed in position around pivot *k*, through the arc described by slot *m*, to provide for fitting the anvil and plunger to the pitch of the teeth of the saw being swaged. The holder F consists of an anvil-bar holder, *o*, which is a sleeve provided with a central square opening, *p*, to receive the anvil-bar G, and having a longitudinal slot, *p'*, cut through from the center of opening *p* to the bottom of the holder *o*. (See Fig. 2.) The holder *o* is also provided with a set-screw, 2, to adjust the anvil-bar toward the saw-tooth, and a set-screw, 3,

to hold said anvil-bar in position when it is adjusted. At right angles to the holder *o* there projects upwardly a cylindrical sleeve, *r*, through the central opening of which plays a plunger, H, having a slot, *s*, cut in its side, and into which projects screw-pin *t*, which passes through a tapped hole in sleeve *r*, and prevents the plunger H from leaving the sleeve, though allowing it a free vertical movement within the length of the slot *s*. The lines of the plunger and the lines of the anvil-bar approach each other at right angles.

The anvil-bar G is provided at one end with the anvil proper, 5, to rest beneath the point of the saw-tooth, and made with a receding curvilinear face, (particularly shown in Fig. 3,) the curve lying across the point of the tooth in contradistinction to curving the anvil with the length of the tooth, as has been done in instances heretofore. The top of the anvil-bar is plane-faced.

The lower end or working-face of plunger H is made with a flat surface, 6, and a curved surface, 7, and an intervening groove, 8, into which the surplus metal of the tooth may be crowded in spreading the point. The flat surface 6 on the working-face of the plunger is so proportioned to the curved portion 7 that when the curved portion has fulfilled its office of sufficiently spreading and drawing out the point of the tooth, said flat surface brings up against the flat surface of the top of anvil-bar G, and prevents further spreading or drawing out at the particular point of the tooth being worked upon, meantime the surplus metal passing beneath groove 8.

In Figs. 5 and 6 we have shown the curved working-face of the plunger curved in two directions—both in the direction of the length of the tooth as inserted to be swaged and across the length of the tooth—while in Figs. 7 and 8 we have shown the curvature of said working-face in the direction of the length of the tooth only.

The curvature shown in Figs. 7 and 8 we deem absolutely essential to successful operation, and that shown in Figs. 5 and 6 as very desirable.

The curved anvil beneath the point and the curved plunger-face striking the point above, by means of blows delivered on the plunger-head with a hammer, enables us to work on small portions of the metal at a time, and gradually draw and spread the point without doing violence to the fiber of the metal or the structure of the point, so as to split or break it, and at the same time we condense and harden the point, so as to have in the tooth the best cutting qualities. During the operation of swaging the point of the tooth is moved by the operator back and forth across the anvil, so as to successively subject each portion of the point to the action of the curved face of the plunger.

When the machine is to be used, a saw is placed on arbor *b*, so that it lies along the outer edge of table A and in line with the meeting faces of the plunger and anvil, and through the medium of screw D the eye of the saw is brought to position, when the tooth-point enters between the curved face of plunger H and anvil-face 5, while head E rests against stop *i*. Then, by means of headed bolt and curved slot *m*, the pitch of the anvil and plunger-holder F is set to suit the pitch of the teeth of the saw being swaged, and the included tooth is ready to be operated on.

When a tooth is swaged, the head E and swaging devices proper are drawn away from shoulder *i*, as shown in dotted lines in Fig. 1, to the extent of chain *g*, another tooth is brought to the swaging-point, the head E returned against stop *i*, and the operation repeated.

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

1. In a saw-swaging machine, a stationary anvil and a movable plunger, H, in combination with a movable head-block, E, substantially as and for the purpose described.

2. The movable head-block E and anvil and plunger, in combination with adjusting devices, substantially as described, to adjust said anvil and plunger to the pitch of the saw-teeth, substantially as set forth.

3. In a saw-swaging machine, the saw-supporting arbor *b*, saddle C, diagonal ways *a a*, and endless screw D, in combination with a pivoted head-block, E, carrying an adjustable swaging device, for the purpose specified.

4. In a swaging-machine, an anvil provided with a face having a convex curvature transverse the length of the applied tooth, in combination with a plunger or similar movable device to deliver a percussive blow on the top of the tooth, substantially as described.

5. The anvil G, provided with a curved face, 5, in combination with a plunger provided with a curved working-face, 7, substantially as described.

6. The movable plunger H, provided at its lower end with flat face 6 and recess or groove 8, substantially as set forth.

GEO. F. SIMONDS.
LUTHER BLAKE.

Witnesses:
H. B. PALM,
G. E. FERSON.