

(No Model.)

2 Sheets—Sheet 1.

H. W. WILLIAMS.

SAW SWAGE.

No. 376,128.

Patented Jan. 10, 1888.

Fig. 1.

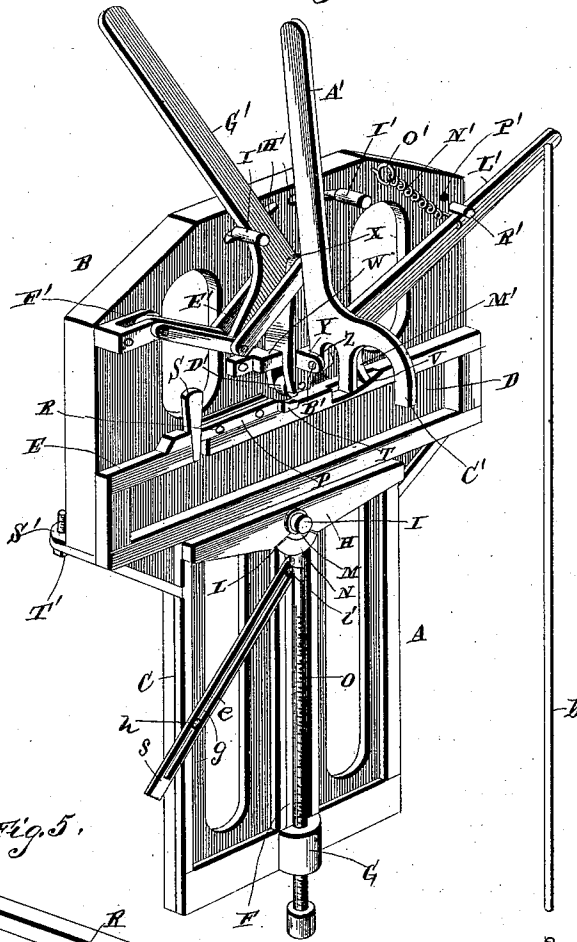


Fig. 5.

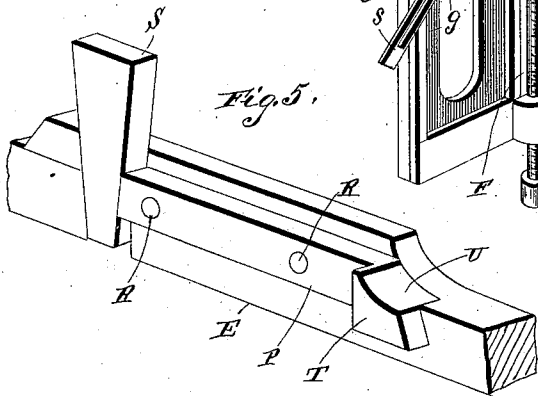
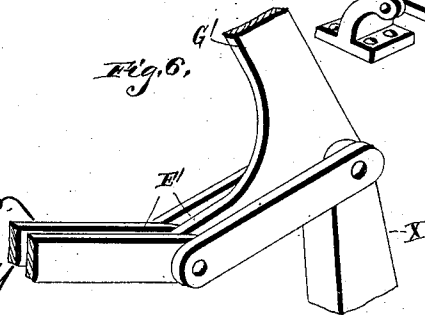


Fig. 6.



Witnesses  
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(No Model.)

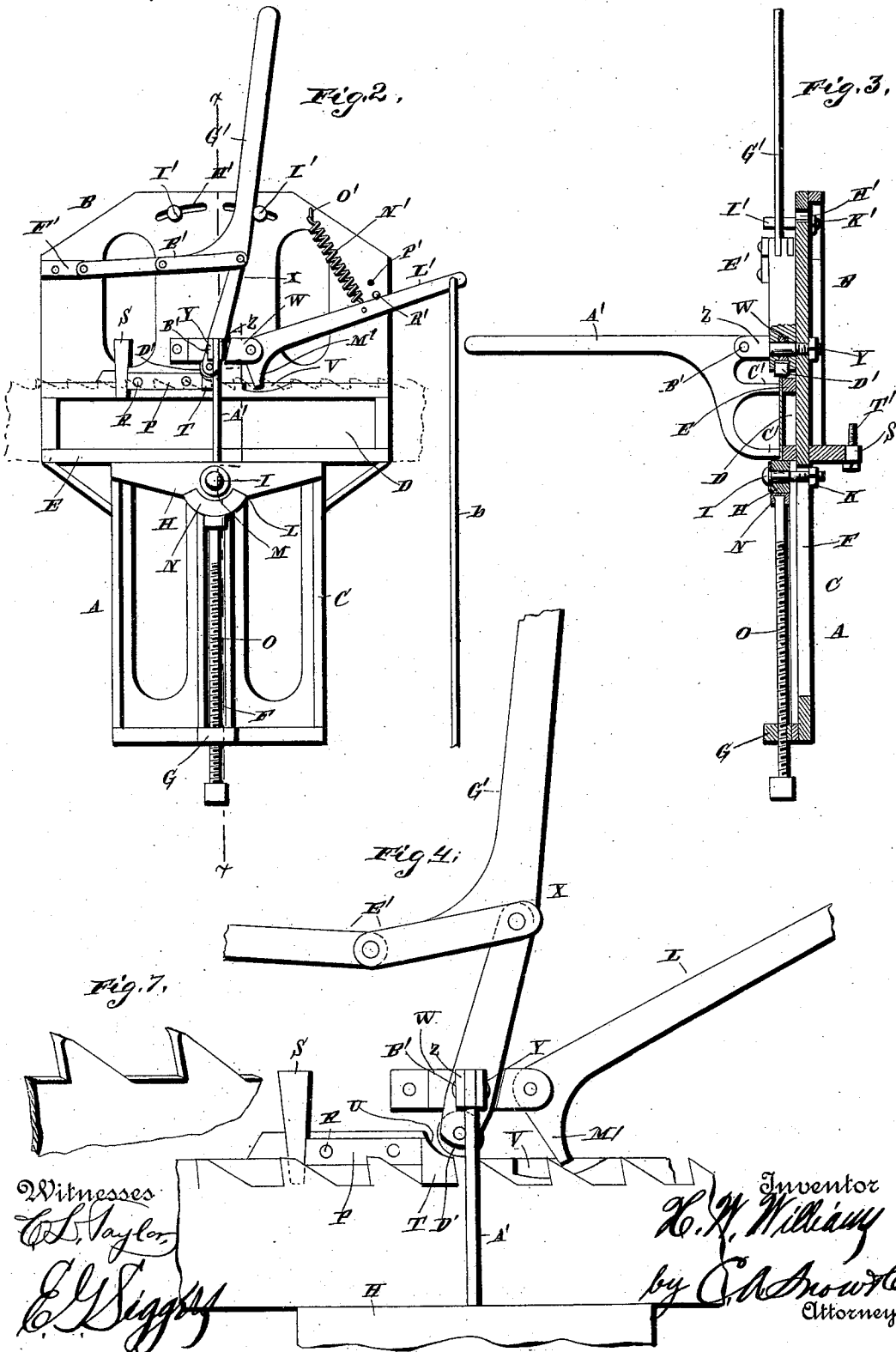
2 Sheets—Sheet 2.

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No. 376,128.

Patented Jan. 10, 1888.



# UNITED STATES PATENT OFFICE.

HAMILTON W. WILLIAMS, OF NASHVILLE, TENNESSEE.

## SAW-SWAGE.

SPECIFICATION forming part of Letters Patent No. 376,128, dated January 10, 1888.

Application filed September 9, 1887. Serial No. 249,262. (No model.)

*To all whom it may concern:*

Be it known that I, HAMILTON W. WILLIAMS, a citizen of the United States, residing at Nashville, in the county of Davidson and State of Tennessee, have invented a new and useful Improvement in Saw-Swages, of which the following is a specification.

My invention relates to an improvement in saw-swages; and it consists in the peculiar construction and combination of devices that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the drawings, Figure 1 is a perspective view of a saw-swage embodying my improvements. Fig. 2 is an elevation of the same. Fig. 3 is a vertical sectional view taken on the line *x x* of Fig. 2. Fig. 4 is a detached perspective view of parts of my improved saw-swaging device. Figs. 5 and 6 are similar views of other parts thereof. Fig. 7 is a detail of a portion of the saw.

A represents the base-plate of a machine, which is provided with the octagonal head B and with the lower rectangular extension, C. On the lower portion of the head B, at the outer side thereof, is formed a rectangular bed, D, which comprises a raised flange, E. In the central portion of the extension C is made a vertical slot, F, at the lower end of which is formed an offset or ear, G, provided with a vertical threaded opening.

H represents a gage-head which is arranged transversely on the face of the extension C, and is provided with a central opening. A bolt, I, extends through the said central opening and through the slot F, and is provided on its inner end with an enlarged head that works in a flanged way that communicates with the slot F. On the outer end of the bolt is screwed a nut, K, which serves to secure the head to the bolt and to clamp the head to the extension C at any desired vertical adjustment. On the under side of this head, at the center thereof, is an incised opening, L, in the apex of which is a downward-projecting rounded offset, M.

N represents a curved yoke which bears against the said offset, and is swiveled to the upper end of a screw, O, that extends through and engages a threaded opening in the ear or offset G.

In the upper side of the flanged bed E, in

one side of the center thereof, is made a longitudinal recess, in which is fitted an anvil, P. The said anvil is secured in place by means of bolts R, and a key, S, is fitted in an opening made in the flanged bed at one end of the anvil and at right angles thereto, the said key bearing against the said anvil. The inner end of the anvil is provided with a head, T, having the curved upper face, U. At a suitable distance from the headed end of the anvil T the flange E is provided in its upper side with a curved recess, V.

W represents a bridge that is bolted to the face of the head B at a suitable distance above the bed-flange E.

X represents a lever which is fulcrumed to the bridge by means of a bolt, Y, the said bolt having its outer end bifurcated to form ears Z.

A' represents a holder-lever, which has its inner end inserted between the ears Z, and pivoted on a bolt, B', that passes through aligned openings in the said ears. The inner end of the said lever is extended to one side, as shown, and provided with arms C', which are adapted to bear against the outer sides of the upper and lower portions of the bed-flange E. The outer end of the said lever projects a suitable distance, in order to form a handle.

The lower end of the lever X, which is opposed to the upper side of the bed-flange and to the head of the anvil, is bifurcated or slotted, and in the slot or opening formed therein is journaled a roller, D', which is made of hardened steel or other suitable material, and is circular in form. E' represents a pair of toggle-levers, which is flexibly jointed to the upper end of the lever X, and serves to connect the same to an offset or other fixed point, F', on one side of the head B. An arm, G', is rigidly attached to the inner member of the toggle E', and extends upward from its end.

In the upper side of the head B are curved slots H', which are drawn on a radius from the center of the fulcrum-bolt Y. I' represents a pair of adjustable stop-pins which project from the face of the head B and have their inner extremities reduced and passed through the slots H', and are provided with clamping-nuts K', which are screwed to their inner ends and serve to clamp them to the head at any desired adjustment in the slots.

L' represents a clamping-lever, which is pivoted to one end of the bridge W by means of one of the bolts that serve to secure the said bridge to the bed. On the lower side of this lever, at the pivoted end thereof, is an arm, M', the end of which is adapted to work in the curved recess V. The outer end of this lever is adapted to be connected to a pedal-lever, a, as shown in Fig. 1, by means of a rod, b. N' represents a coiled retractile spring, which has one end attached to the lever L', and its upper end attached to a screw-eye or keeper, O', that projects from the upper side of the head. A series of openings, P', is made in the said head, at suitable distances apart, and a stop-pin, R', is adapted to be inserted in one of the said openings and limit the upward movement of the lever L'.

The operation of my invention is as follows:  
 20 The plate A is attached in a vertical position to one side of a suitable bench and is provided with a horizontal flange, S', that bears against the lower edge of the side of the work-bench and is secured thereto by means of bolts T', which pass through openings in the ends of the flange and enter the side of the bench. The outer edge of the saw is arranged against the gage H in such a position that one side of the saw bears against the bed-flange E. One side of one of the saw-teeth is caused to bear against the inclined inner end of the anvil-head T. The screw O is turned so as to cause the gage H to hold the saw in position and to permit the saw to be moved longitudinally from time to time. The curved offset I of the gage-head and the curved yoke M, which is swiveled to the screw O and bears against the said offset, enable the gage-head to be turned to any desired angle, according to the shape of the saw-blade, and thereby keep the teeth of the saw in their proper position relative to the anvil-head. The lever A' is turned down, so as to cause its arms to bear against the outer side of the saw-blade and thereby hold the latter firmly in contact with the bed-flange E, and the lever L' is moved downward, so as to cause its arm M' to engage one of the saw-teeth. The lever G' is in its initial position when it is turned to the left, as indicated in Fig. 1, thereby causing the toggle-jointed levers E' to move the upper end of the lever X to the left and to move the lower end of the said lever to the right from the curved face of the anvil-head. This leaves a slight space between the face of the roller D' and the corner of the anvil-head, into which the point of the tooth to be swaged projects. The lever G' is now turned to the right to the position indicated in Fig. 2, which causes the lower end of the lever X to sweep to the left and thereby cause the roller D' to impinge against the corner of the anvil-head and to move on the curved face thereof, and consequently compress the point of the saw-tooth so forcibly between the opposing sides of the anvil-head and the roller that the point of the tooth will become broadened and swaged, as will be read-

ily understood. By providing the lever X with the fulcrum-roller D' the latter is caused to roll or rotate slightly when in contact with the point of the saw-tooth while swaging the same, thereby reducing friction and consequently enabling the lever to be more readily operated.

Heretofore, so far as I am aware, saw-teeth have been swaged by arranging their points between anvil-heads and punches, which are caused to slide over the edges of the teeth while swaging the same. This sliding movement of the punch on the edge of the tooth is accompanied by so much friction that it sometimes results in breaking off the point of the tooth, instead of swaging the same; but by substituting the rotating roller for the punch and enabling the said roller to partly rotate while in contact with the edge of the tooth the strain exerted on the tooth is more easily distributed thereon, and although the pressure is in no wise relaxed, yet the danger of breaking off the point of the tooth is very sensibly lessened.

The toggle-levers E', which connect the lever X to a fixed point on the bed-plate, are caused by the lever G', which is firmly attached to the said toggle-jointed levers, to exert very greatly increased force on the lever X at the instant when the latter is completing its stroke and when the most powerful operation of the said lever is required.

The pins I' enable the stroke of the lever G', and consequently of the lever having the roller, to be regulated at will, inasmuch as the lever G' strikes against the said pins I' at each end of its stroke.

In order to adapt the machine to be used for swaging circular saws, I provide a gage, e, which is of the construction shown in Fig. 1, and which comprises an arm, s, having a longitudinal slot, g. A sliding pin, h, which works in the said slot, is adapted to be moved in or out therein, and is provided with a nut, whereby it may be clamped at any desired position, and a bolt, i, which also passes through the said slot and is clamped therein and serves as the fulcrum for the arm.

Having thus described my invention, I claim—

1. In a saw swage, the combination of the anvil, the operating-lever, and the roller journaled in the said lever and adapted to turn while in contact with the edge of the saw-tooth, substantially as described.

2. The combination, in a saw-swage, of the anvil, the operating-lever having the roller D', for the purpose set forth, and the clamp-lever adapted to engage one of the teeth of the saw and hold the same in position when the operating-lever is operated, substantially as described.

3. The combination, in a saw-swage, of the lever X, the roller D', journaled at the free end thereof, the toggle-jointed levers connecting the lever X to a fixed point, and the lever G', attached to the said toggle-jointed levers, substantially as described.

4. The combination, in a saw-swage, of the bed-plate, the operating-lever pivoted thereon and having the roller D', for the purpose set forth, and the adjustable stops to limit the motion of the operating-lever, substantially as described.

5. The combination, in a saw-swage, of the bed-plate and the anvil recessed therein and bolted thereto, substantially as described.

6. The combination, in a saw-swage, of the bed-plate, the anvil recessed therein and bolted thereto, and the key or wedge bearing against the outer end of the anvil to retain the latter against displacement, substantially as described.

7. The combination, in a saw-swage, of the bed-plate, the bridge secured thereto, the operating-lever fulcrumed to the bridge and having the roller D', the lever L', also fulcrumed to the bridge and having the arm M', for the purpose set forth, and the anvil, substantially as described.

8. The combination of the bed-plate having the bed-flange provided with the recess V, the lever L', having the arm M', adapted to operate in the said recess, for the purpose set forth, the anvil, and the swaging-lever, substantially as described.

9. The combination, in a saw-swage, of the

bed-plate, the lever L', having the arm M' to engage one of the teeth of the saw and hold the same in position while being swaged, and the spring to normally disengage the said lever from the saw when the lever is released, substantially as described.

10. The combination, in a saw-swage, of the bed-plate having slot F, the adjusting-screw O, the gage-head connected to the ends of the said screw and movable thereby, and the pivotal bolt extending through the gage-head and working in slot F, substantially as described.

11. The combination, in a saw-swage, of the adjusting-screw O, the yoke swiveled to the said screw, and the pivoted gage-head pivotally bearing on the yoke, substantially as described.

12. The combination, in a saw-swage, of the adjusting-screw, the curved yoke swiveled thereto, and the gage-head having the convex offset bearing against the concave side of the yoke, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

HAMILTON W. WILLIAMS.

Witnesses:

MYRTLE SIGGERS,

E. G. SIGGERS.