No. 835,220. PATENTED NOV. 6, 1906.

V. H. & A. K. HANCHETT.

SWAGE SHAPER FOR SAWS.

APPLICATION FILED NOV. 21, 1904.

2 SHEETS—SHEET 1.

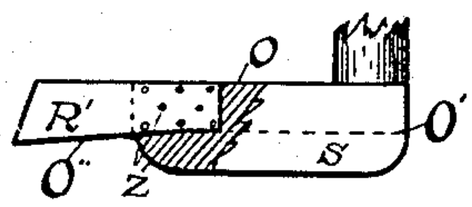

Fig. 8.

Fig. 1.

Fig. 2.

Fig. 3.

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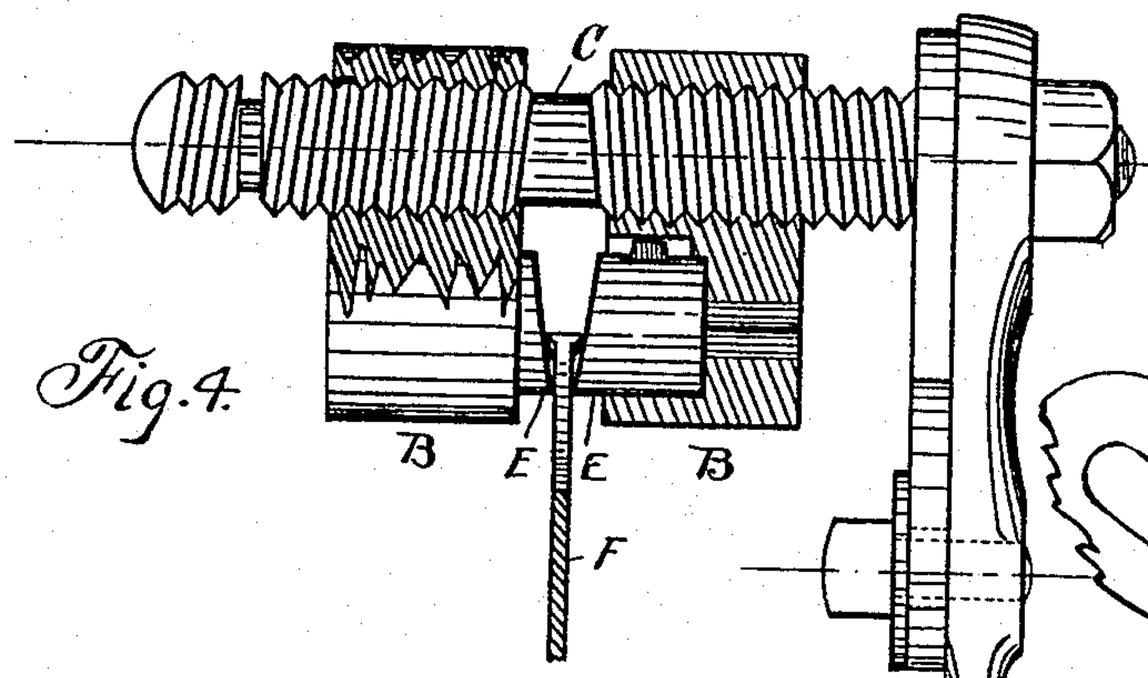

Fig. 4.

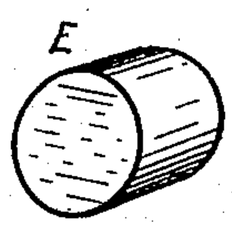

Fig. 6.

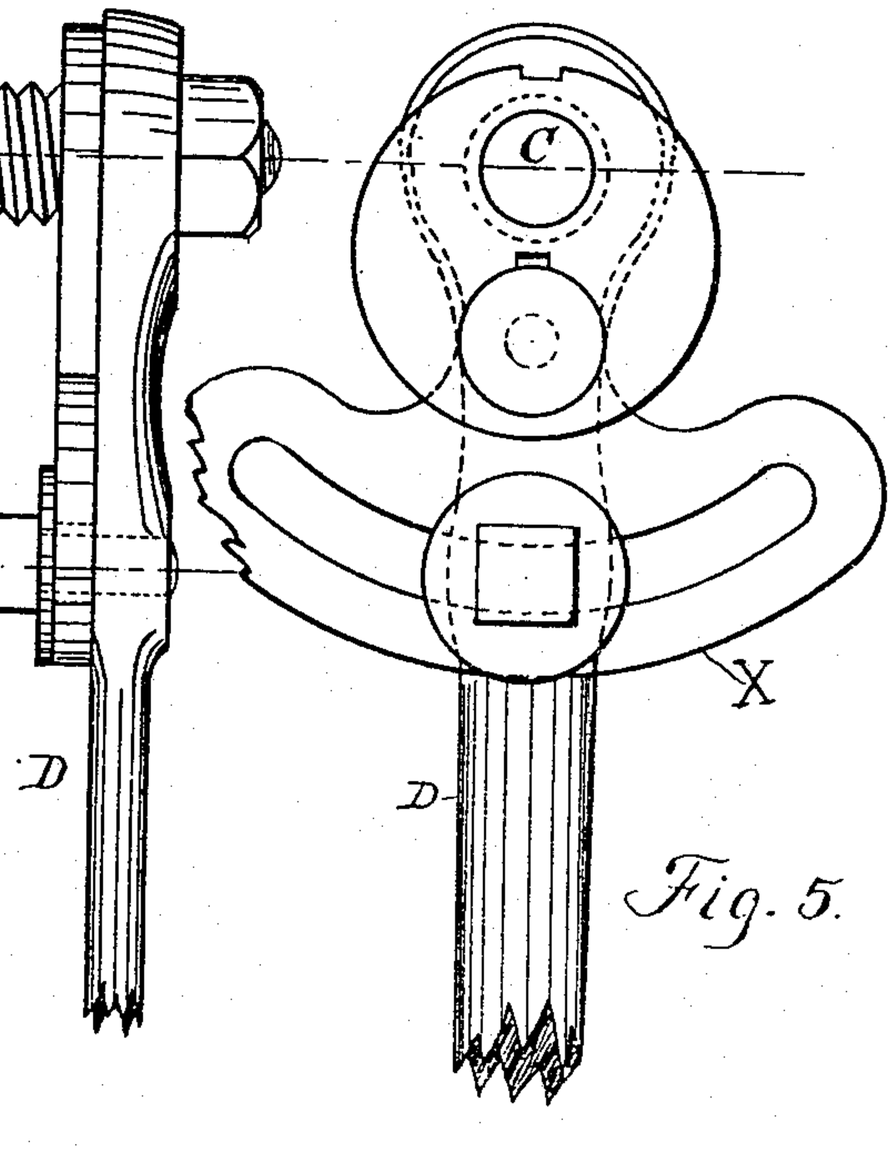

Fig. 5.

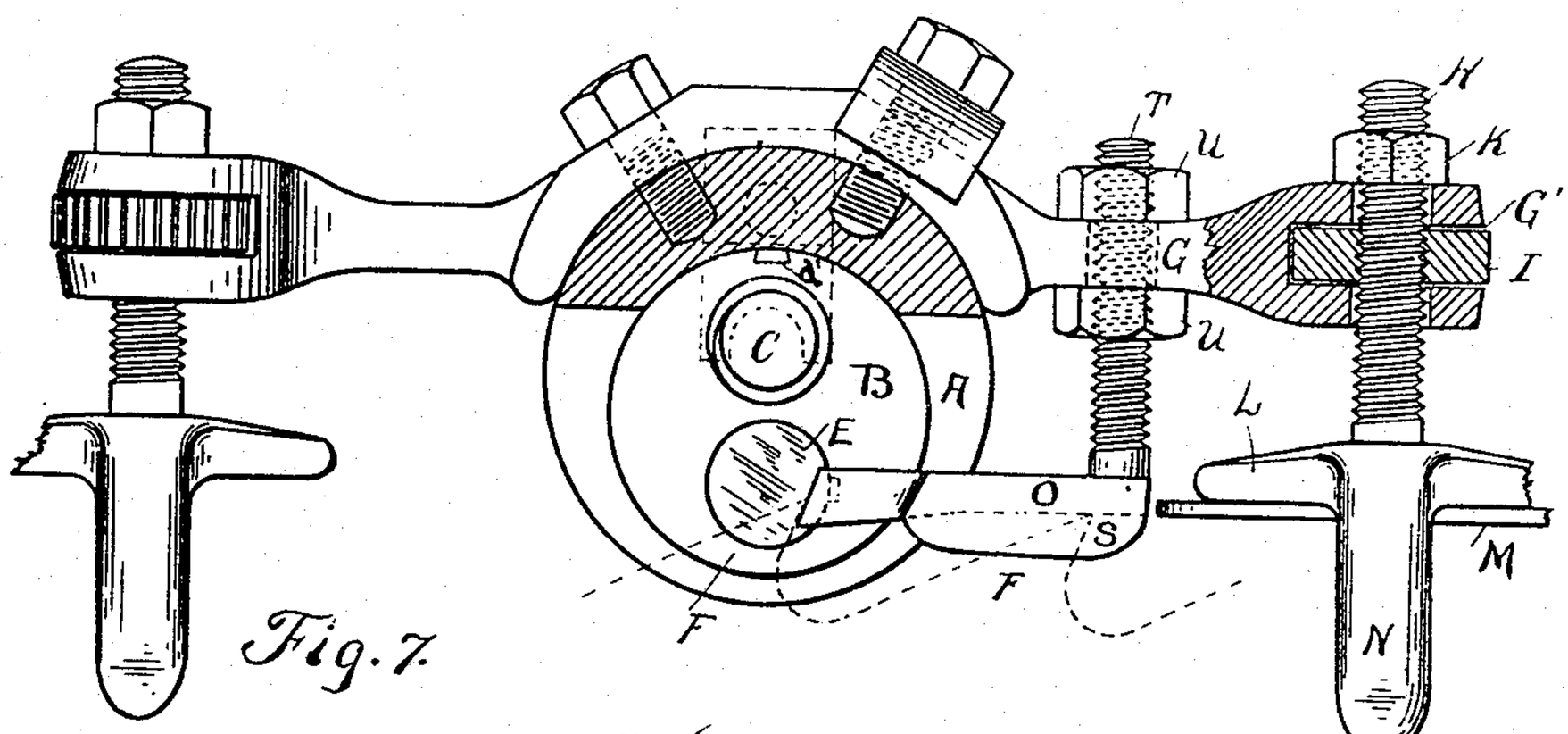

Fig. 7.

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UNITED STATES PATENT OFFICE.

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SWAGE-SHAPER FOR SAWS.

No. 835,220. Specification of Letters Patent. Patented Nov. 6, 1906.

Application filed November 21, 1904. Serial No. 233,703.

To all whom it may concern:

Be it known that we, VOLNEY H. HANCHETT and ARTHUR K. HANCHETT, citizens of the United States, residing at Big Rapids, in the county of Mecosta and State of Michigan, have invented certain new and useful Improvements in Swage-Shapers for Saws; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention is an improvement in swage-shapers for saws, and relates more particularly to a swage-shaper especially adapted for shaping or pressing the sides of the teeth on a band-saws, band-resaws, and gang-saws and similar saws having straight cutting edges as distinguished from circular saws.

The improvement relates more particularly to devices carried by a swage-shaper whereby the dies will always be brought to the same relative position on each tooth when the swaging operation occurs to the effect that all the teeth may be shaped exactly the same width on the face and beveled downwardly from the point and backward from the face at the same angle from the point and face no matter what the shape of the teeth, the irregularity of spacing, or the pitch of the teeth.

A further object is to provide means whereby the teeth of the saw are kept from striking on the sides of the shaper or on the dies as they pass by the teeth.

A further object is to provide means whereby the swage-shaper will be guided along the saw-teeth and kept from tilting upward or backward and also kept in line on the saw, the devices by which this is accomplished being vertically adjustable to regulate the depth or distance down that the swaging action shall take place on the teeth.

With these objects in view the invention consists in the devices illustrated in the accompanying drawings and the equivalents thereof.

Figure 1 is a side view of a swage-shaper embodying our improvements, the shaper being shown in the position it occupies when being moved along the teeth of a band-saw. Fig. 2 is an enlarged side view of the gage or guide by which the teeth area upon which the shaping-dies act is regulated. Fig. 3 is a part longitudinal section of the same. Fig. 4 is a part section through the opposing shaping-dies, showing them in action on a saw-tooth. Fig. 5 is a side view of the arm by which the die-operating screw is rotated. Fig. 6 is a perspective of one of the dies. Fig. 7 is a partial longitudinal section, on a large scale, showing the operation of the guides. Fig. 8 is a modified form of gage or guiding-shoe.

The general operation of the swage-shaper will be understood from Figs. 1 and 4, where A is a shell or head, in which are mounted two transversely-slidable plugs B, traversed, respectively, by the right and left hand ends of the screw C, which is actuated by the handle D to advance or retract the blocks B toward or from each other. The plugs are slidably but non-rotatably held in the head A by means of the keys or feathers *a'*. (See Fig. 7.) The plugs B carry beveled dies E, which clamp the saw-teeth and press or swage their sides into the desired form and dimensions. The screw C is actuated by the handle D, mounted loosely on the screw-shaft and adjustably connected to a sector X. non-rotatably mounted on the screw-shaft.

It is evident from Fig. 4 that raising or lowering the dies E relatively to the saw F will vary the tooth area acted upon by the dies, and consequently vary the shape of the finished tooth.

As has been previously stated, the object of our present improvement is to so guide the dies and to so adjust their position relative to the points of the successive teeth on which they operate that all the teeth will be formed exactly alike. It is essential that the head A be kept from tilting forward or backward when the lever D is rocked back and forth in the swaging operation. To accomplish this result, we secure to the head A, by screws or otherwise, a pair of horizontal projecting arms G G, extending forward and back of the shaper parallel with the saw. The ends of the arms G are bifurcated horizontally, as at G', and a screw H passes through the upper and lower parts of the bifurcated end. In the bifurcation is a knurled nut I, threaded on the screw H for vertically adjusting the screw. A set-nut K clamps the screw in its adjusted position. At the lower end of each screw H is a horizontal arm L, having on its

lower face a hardened-steel shoe M and at each side one prong of a downwardly-projecting fork N.

The swage-shaper may be drawn along the teeth of the saw, as indicated in Figs. 1 and 7, the shoes M sliding along the points of the teeth. Vertical adjustment of the dies E to give any desired amount of pressure area on the teeth is had by properly setting the shoes M by means of the nuts I.

It is essential in a machine of this kind that not only the vertical position of the dies E be exactly the same on all the teeth, but that the horizontal distance from the point of the tooth to the center of the die E be the same at each swaging operation.

Heretofore it has been common to adjust the horizontal position of the dies E by means of gages or similar devices engaging the roots of the teeth; but it is found in practice that if the roots of the teeth are not all the same depth the effect will be to produce teeth of uneven widths, causing the saw to cut unevenly.

In the gage illustrated in the accompanying drawings it is evident that this difficulty is obviated and a uniform width of all the teeth is assured by arranging the gage to measure the adjustment of the dies from the point of the tooth instead of from its root.

A further advantage is that the machine when drawn forward along the teeth of the saw will automatically indicate by a clicking sound and a slight feeling of raising and dropping of the shaper when the gage is at the point of the tooth, so that the operator can shape a tooth and move immediately to the next one, stopping the machine in position for shaping the next tooth without watching the position of the guide, thereby greatly increasing the speed of operation of the machine. We attain these results by means of the shoe O, the lower face of which is horizontal, as at O′, near the front and inclines downwardly and rearwardly, as at O″, near the back of the shoe. The back or toe of the shoe terminates in a projecting tooth R, adapted to pass between the dies E E and engage the point of the saw-tooth F. The front part of the shoe has downwardly-depending wings S, that pass along the sides of the saw-teeth as the shoe moves forward. Vertical adjustment of the shoe is had by means of a screw T, passing through the arms G and held in place by set-nuts U.

The particular construction of shoe O which we prefer to employ in practice is illustrated in Fig. 8, where the tooth R′ is made of tool-steel and tempered, being inserted in the slotted end of the shoe O and held in place by rivets Z Z, as shown in the drawings. By forming the inserted tooth R of hardened tool-steel upsetting its end where it comes in contact with the teeth of the band-saw is avoided, and the shoe is thus made much more durable than if the tooth R′ were made of iron or soft steel.

When the machine is drawn forward along the saw-teeth, as indicated in Figs. 1 and 7, the downwardly-extending face O″ rides up the inclined back of the tooth and slightly lifts the machine. As soon as the point of the projecting tooth R passes the point of the saw-tooth the machine drops to place again and a slight metallic click is heard and a slight jar is felt on the handle, indicating that the machine is in position to swage the next tooth. A slight backward movement brings the tooth R snug up against the cutting edge of the saw-tooth, and the operator by the movement of the handle D shapes the sides of the teeth. A handle G^2 is stationarily secured to the head in any suitable manner, whereby to enable the operator to move and steady the machine during its operation.

By the means above described we have produced a swage-shaper for band-saws that is not only adjustable for various sizes of saws, but is applicable to any spacing of teeth and produces teeth of perfectly uniform shape at their points and faces or cutting edges.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a swage-shaper, the combination with a slotted head and dies carried thereby, of means for preventing the tilting of the shaper, and means for gaging the position of the shaper, said means comprising an adjustable support and a laterally-extending grooved shoe, the work adapted to be received in the groove in the shoe and a toe or tooth carried by the shoe and adapted to take against the work.

2. In a swage-shaper, the combination with a slotted head and dies carried thereby, of means for preventing the tilting of the shaper, and means for gaging the position of the shaper, said means comprising a support adjustably mounted in advance of the dies and a rearwardly-projecting shoe, carried by the support, depending wings on the shoe between which the work is received, the lower face of the shoe at the heel being formed on a horizontal plane, and inclined downwardly to the toe of the shoe, the latter receivable in the slot in the head.

3. In a swage-shaper, the combination with a suitable slotted head and shaping means carried thereby, of means for preventing the tilting of the shaper, said means comprising arms, oppositely projecting from the head and having open slots at their outer ends intersected by apertures, a screw-stud received in the aperture at the outer end of each arm, a depending fork carried by each of the studs and embracing the work, a nut located within the slot in the outer end of each arm, the screw-studs passing through the nuts and means mounted on the screw-

studs and adapted to engage the arms to cooperate with the nuts to lock the studs in adjusted position.

4. In a swage-shaper, the combination with a slotted head carrying swage-shaping mechanism, and means for preventing the tilting of the head, of gaging means located in advance of the head and projecting into the slot in the head, said last-named means provided with a horizontal surface adapted to rest upon the work and an inclined surface terminating in a tooth adapted to extend to a point beneath the edge of the work under treatment and to engage the work to position the shaper.

5. In a swage-shaper for saws, the combination with a head, swaging mechanism, and means for preventing the tilting of the head, of a gage vertically adjustable toward and from the toothed edge of the saw, said gage comprising a shoe adapted to rest upon the teeth of the saw and a tooth of a material different from that of the shoe and inclined to a point beneath the plane of the shoe for engagement with the tooth of the saw, to position the shaper.

In testimony whereof we affix our signatures in presence of two witnesses.

VOLNEY H. HANCHETT.
ARTHUR K. HANCHETT.

Witnesses:
C. W. BARTON,
CHAS. E. BERGER.