

(No Model.)

2 Sheets—Sheet 1.

W. W. ANNABLE.
SAW SWAGE.

No. 458,841.

Patented Sept. 1, 1891.

Fig. 1.

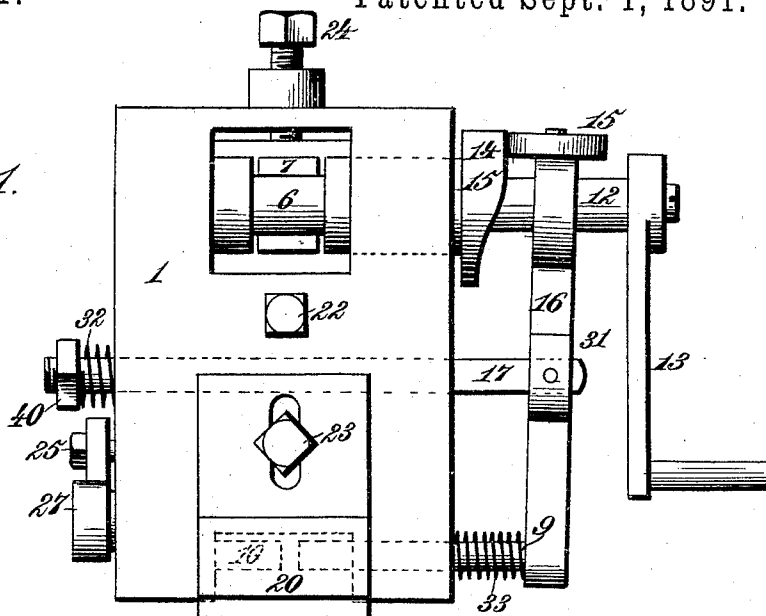


Fig. 2.

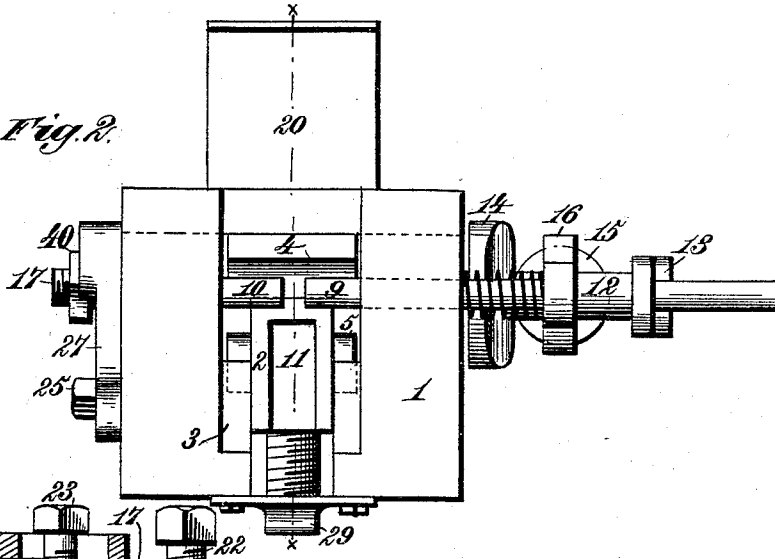
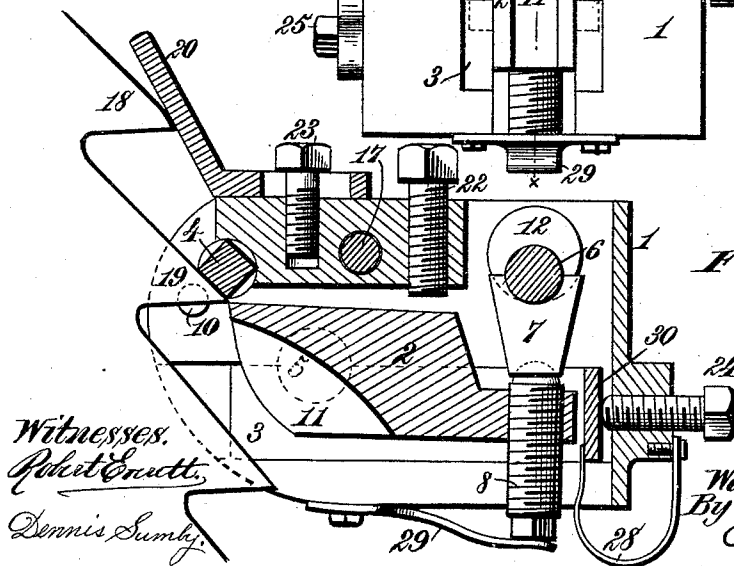


Fig. 3.



Witnesses.
Robert C. Smith,
Dennis Sumby.

Inventor:
Warren W. Annable.
By *Edward Tappan, Atty.*

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2 Sheets—Sheet 2.

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Fig. 4.

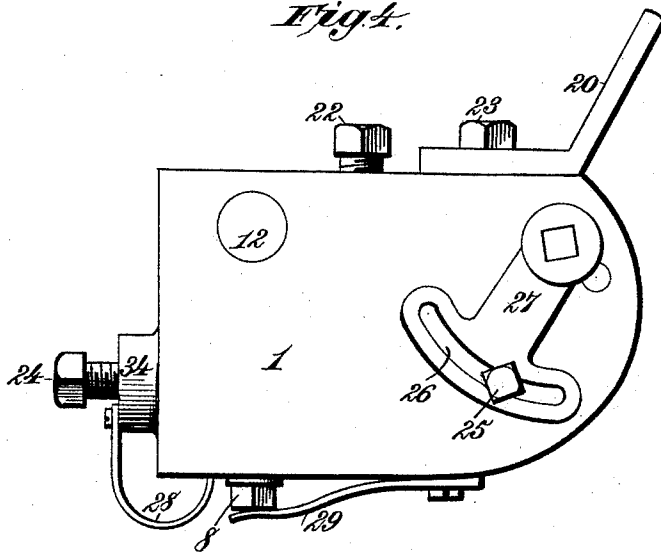


Fig. 5.

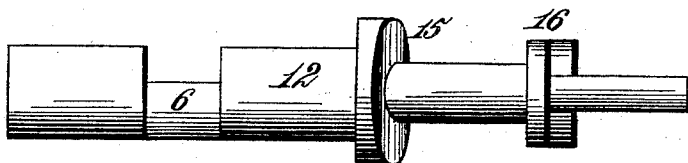
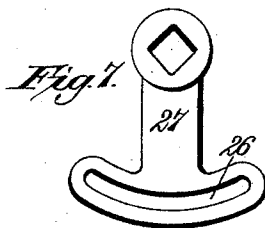
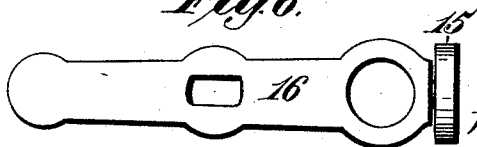


Fig. 6.



Witnesses,
Robert Smith,

Dennis Sumbly,

Inventor,
Warren W. Annable,
By *Edward Taggart,*
Atty.

UNITED STATES PATENT OFFICE.

WARREN W. ANNABLE, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR OF TWO-THIRDS TO FRANK A. BALDWIN AND VICTOR M. TUTHILL, OF SAME PLACE.

SAW-SWAGE.

SPECIFICATION forming part of Letters Patent No. 458,841, dated September 1, 1891.

Application filed November 12, 1890. Serial No. 371,178. (No model.)

To all whom it may concern:

Be it known that I, WARREN W. ANNABLE, a citizen of the United States, residing at the city of Grand Rapids, in the county of Kent and State of Michigan, have invented a certain new and useful Saw-Swage, of which the following is a specification.

This invention has for its object to provide a novel saw-swage, wherein the upper anvil is adjustable to the angle of the upper side of the saw-tooth; to provide novel means for simultaneously operating the swaging-die and the tooth-clamping devices; to provide novel means for actuating the oscillatory swaging-die, and to provide novel means whereby the swaging-die is adapted to move backward when brought against the saw-tooth for the purpose of giving a drawing pressure upon the under side of the tooth. To accomplish these objects, my invention involves the features of construction, the combination or arrangement of devices, and the principles of operation hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 shows a plan view of a saw-swage constructed in accordance with my invention. Fig. 2 shows a front view of the same. Fig. 3 shows a sectional view on line *xx* of Fig. 2. Fig. 4 is a side elevation showing the device for adjusting the anvil. Fig. 5 shows a detached view of the parts which operate the die and also the clamping device. Fig. 6 shows a preferred form of the lever which operates the clamping device, and Fig. 7 is a detail view of the slotted arm for adjusting the anvil.

Similar figures refer to similar parts throughout the several views.

1 represents the body of the swage, which may be constructed of a single piece and is preferably made of cast-iron.

2 represents the lower die, which is supported within the yoke-bearing 3, the yoke-frame resting within the case. The die 2 turns upon a fulcrum 5 and is raised and lowered by means of the crank 6, which engages with the bearing 7, acting on the screw 8, engaged with the rear end of the die 2. The

crank 6 is preferably made integral with the crank-shaft 12, which shaft is operated by a crank 13.

4 represents the upper die or anvil. By pivoting the lower die at a point near its front end, as at 5, as shown, the bearing edge or face of the die, which presses upon the point of the saw-tooth, draws back after coming in contact with the tooth. This drawing back draws out the end or point of the saw-tooth, instead of upsetting it, and a minute part of the tooth-point is cut off, thus leaving the finished tooth substantially the same length as it was before it was swaged.

The clamping device is shown by the stationary part 10 and the movable part 9. The movable part 9 engages with the lever 16, and is provided with a spiral spring 33, for the purpose of crowding the end of the lever to which the movable part 9 is applied outwardly from the machine, thereby opening the jaws 9 and 10 when the same is not pressed up by means of the lever, as herein-after described. The lever 16 is provided with an opening, so as to fit loosely upon the shaft 12. This, however, is not necessary, but I have constructed it in this manner for convenience of support. The lever 16 turns upon a pivot 31, which pivot passes through the lever 16 and through the fulcrum-rod 17, the fulcrum of lever 16 being pivot 31. One end of the lever 16 is provided with the friction-roller 15, which bears against the cam 14. The friction-roller 15 turns readily upon a pivot fixed in the end of lever 16, while the cam 14 is rigidly attached to the crank-shaft and moves with the same.

The fulcrum-rod 17 is provided with an adjusting device whereby the opening between the jaws 9 and 10 may be quickly adjusted, so as to be adapted to saws of different thickness. The adjusting device here shown is composed of a nut 40, engaging with a screw-thread on the rod 17. A spring 32 is used between the nut and the body of the swage, in order to prevent the too rigid action of the jaws 9 and 10.

The operation of that part of my invention above described is as follows: By revolving

the shaft 12 by means of the crank 13, crank 6, acting on the bearing 7, depresses one end of the die 2, raising the other end and thereby pressing the end of the saw-tooth between the anvil 4 and the die 2. The cam is so constructed that just before the lower die is brought in contact with the end of the teeth, so as to perform the swaging operation, the end of lever 16, to which the roller 15 is attached, is pressed outwardly from the main body of the machine, thereby moving the clamping-piece 9 in an opposite direction and securely clamping the saw-tooth between jaws 9 and 10, holding it there until the swaging operation has been performed and until the same has been released by the further revolution of the shaft 12. The front end of the die 2 is provided with a slot 11, in order to allow for the insertion of the saw-tooth between the anvil and the die. The position of the saw-tooth when inserted is shown by 19, and the position of the tooth next above is shown by 18, the saw-tooth 18 resting against the saw-guide 20, thereby holding the saw and teeth in proper position. Saw-guide 20 is attached to the top of the body 1 by means of a screw, as 23, or by any other suitable means. The anvil 4 projects outwardly through the body and engages with the slotted arm 27, which arm is provided with a slot 26, and also with a screw 25. By this means the anvil 4 may be turned in either direction, so as to adjust itself to the incline of the upper part of the saw-tooth, and when so adjusted may be held rigidly in position by means of the set-screw 25. The movement of the lower die from the anvil is limited and adjusted by means of the set-screw 22.

24 is a screw for adjusting the yoke which holds the lower die, said screw 24 coming in contact with the rear end of the yoke, which end is shown by 30 in Fig. 3. The yoke is held in close contact with this screw by means of a spring 28, so that by turning the screw 24 the yoke, and with it the lower die, may be moved to and from the front part of the machine.

29 is a spring which holds the screw 8 in contact with the depressing-yoke 7. The arm 17 is adjusted longitudinally, and when adjusted is held in a rigid position by means of the set-nut 40. The yoke-frame 3 is constructed in the form of a box having two sides and one end, the bottom, top, and one end being left open, which openings are shown in Fig. 2. The rear of the machine may project outwardly, or a piece 34 may be attached thereto for the purpose of furnishing a support for the screw 24 and the spring 28. The machine may be provided with an adjustable attachment to any suitable rigid support.

Having thus described my invention, what I claim to have invented, and desire to secure by Letters Patent, is—

1. In a saw-swaging machine, the combination of a pivoted oscillating and adjustable

lower swaging-die with an anvil arranged above the swaging-die and adjustable to the angle of the upper side of the saw-tooth, substantially as described.

2. In a saw-swaging machine, the combination of a pivoted oscillating and adjustable lower swaging-die with an anvil arranged above the swaging-die and adjustable to the angle of the upper side of the saw-tooth and a crank-shaft operating to depress the inner end of the swaging-die and elevate its outer end, substantially as described.

3. In a saw-swaging machine, the combination of a pivoted oscillating lower swaging-die having at its rear end an adjustable screw 8, and a bearing 7, engaging the screw, with a shaft having a crank 6, acting on the said bearing to depress the rear end of the swaging-die and elevate its front end, and an anvil arranged above the swaging-die and adjustable to the angle of the upper side of a saw-tooth, substantially as described.

4. In a saw-swaging machine, the combination of a pivoted oscillating lower swaging-die having an adjustable screw at its rear end with a shaft having a crank 6, serving to depress the screw and thereby elevate the front end of the swaging-die, and an anvil arranged above the swaging-die, substantially as described.

5. In a saw-swaging machine, the combination, with the body of the machine, of an adjustable yoke arranged in the body, an oscillating lower swaging-die pivoted near its front end to the adjustable yoke, a shaft having a crank acting to depress the rear end of the swaging-die to elevate its front end, and an anvil arranged above the swaging-die and adjustable to the angle of the upper side of a saw-tooth, substantially as described.

6. In a saw-swage, the combination of the lower die supported in a yoke, the yoke, a set-screw, as 24, and a spring, as 28, for the purpose of adjusting the said lower die, substantially as described.

7. In a saw-swaging machine, the combination, with an anvil, of an oscillating swaging-die pivoted near its front end and adapted to move backward when brought against the saw-tooth for the purpose of imparting a drawing pressure upon the under side of the saw-tooth, and means for operating the swaging-die, substantially as described.

8. In a saw-swaging machine, the combination, with an anvil, of an oscillating swaging-die pivoted near its front end and adapted to move backward when brought against the saw-tooth for the purpose of imparting a drawing pressure upon the under side of the saw-tooth, and a shaft having a crank acting to depress the rear end of the swaging-die, substantially as described.

9. In a saw-swaging machine, the combination, with the body of the machine, of an anvil, a spring-yielding yoke-frame arranged in the body, an oscillating swaging-die pivoted

near its front end to the spring-yielding yoke-frame, and means for operating the swaging-die, substantially as described.

5 10. In a saw-swaging machine, the combination, with the body of the machine, of an oscillating swaging-die, an anvil arranged above the die, a lengthwise spring-yielding arm 17, the stationary clamping-jaw 10, the lever 16, pivotally engaged with the spring-yielding
10 arm and provided at one end with a friction-roller 15, the movable clamping-jaw 9, connected with the opposite end of the lever, a

shaft 12, having a crank 6, and a bearing acted on by the crank and serving to depress the rear end of the swaging-die, substantially 15 as described.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

WARREN W. ANNABLE. [L. S.]

Witnesses:

EDWARD TAGGART,

HARRY P. VAN WAGNER.