G. W. BUGBEE.

Devices for Setting Saw-Teeth.

No. 141,990. Patented August 19, 1873.

Fig. 1.

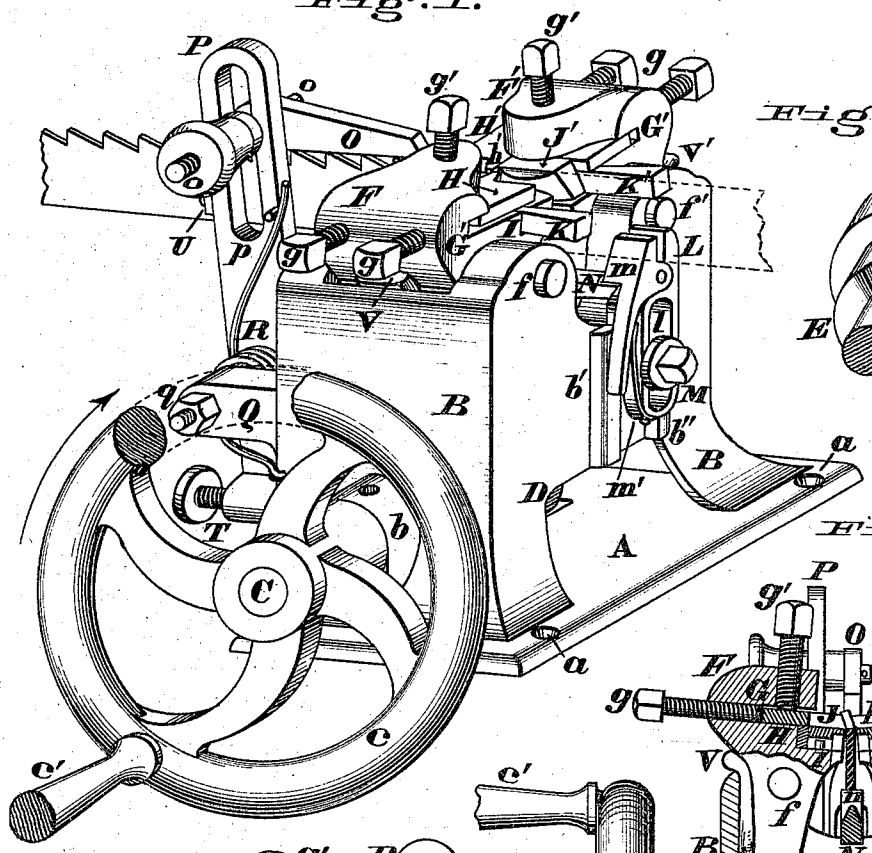


Fig. 5.

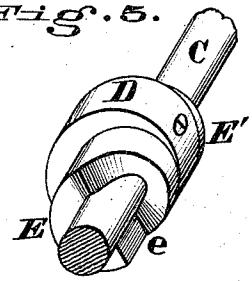


Fig. 3.

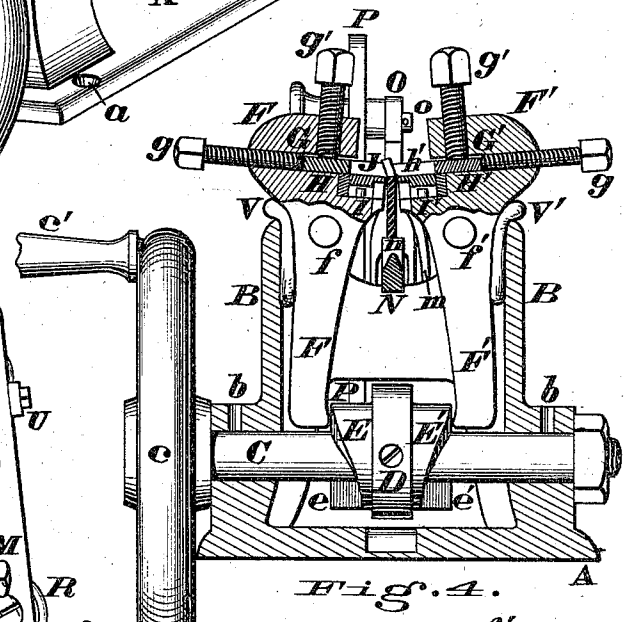


Fig. 2.

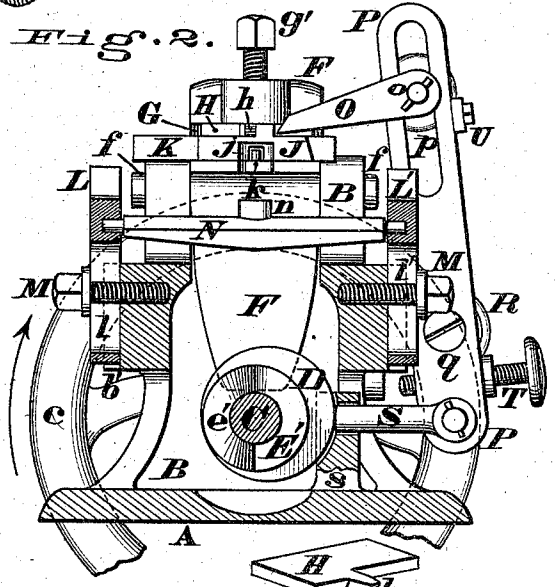


Fig. 4.

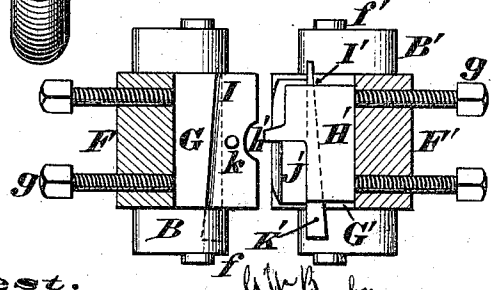
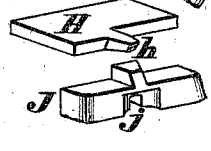


Fig. 6.



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UNITED STATES PATENT OFFICE.

GEORGE W. BUGBEE, OF CINCINNATI, OHIO, ASSIGNOR TO J. A. FAY & CO., OF SAME PLACE.

IMPROVEMENT IN DEVICES FOR SETTING SAW-TEETH.

Specification forming part of Letters Patent No. **141,990**, dated August 19, 1873; application filed May 20, 1873.

To all whom it may concern:

Be it known that I, GEORGE W. BUGBEE, of Cincinnati, Hamilton county, Ohio, have invented a new and useful Saw-Set, of which the following is a specification:

This invention relates to a machine wherewith two contiguous teeth of a saw can be sprung or "set" in opposite directions at the same moment, and so on continuously throughout the whole or any portion of its cutting-edge, by the rotation of a driving-shaft, which is operated by hand or otherwise. This driving-shaft is located near the base of the machine and parallel therewith, and carries two cams, which are adapted to impinge against the lower ends of two vibrating jaws, the latter being pivoted to the frame or housing of the implement. The upper and exposed ends of these jaws are armed with two distinct pairs of bits and opposing die-blocks, which are capable of such adjustment as for each pair to vibrate in a plane parallel to, and the "pitch distance" from, the other pair. These two pairs of bits and die-blocks operate, when in motion, to set the saw-teeth, two at a time, in opposite directions, the saw, after each said action of the jaws, being automatically fed forward double the pitch distance, for a repetition of the same action on the next succeeding pair of teeth, by the action of a pawl pivoted to the upper end of a vibrating lever that is actuated by an eccentric on the driving-shaft. After two teeth have been set by the closure of the aforesaid jaws, the latter are then separated, so as to liberate the saw, by the action of springs, as hereinafter fully described, and are made to act on the pair next succeeding in the same way, and so on until the entire series of teeth have been set.

Figure 1 is a perspective view of a saw-set embodying my improvements, a portion of the fly-wheel being broken away. Fig. 2 is a vertical section taken transversely of the driving-shaft. Fig. 3 is a vertical section taken longitudinally of said shaft. Fig. 4 is a horizontal section through the upper portion of the vibrating jaws, the bits being removed from the left jaw. Fig. 5 is a perspective view of a portion of the driving-shaft and its accompanying eccentric and cam, and Fig. 6 is a perspective view of a pair of bits detached from the jaw.

A represents the base or bed plate of the machine, having apertures *a* in it, for the reception of screws or bolts, so as to allow the implement to be attached to a table, bench, or other suitable support. Cast with this bed-plate is a vertically-projecting frame or housing, B, to which the operative parts of the implement are applied. Journaled athwart the lower portion of this housing, in bearings *b*, is a driving-shaft, C, that carries a fly-wheel, *c*, having a handle, *c'*, wherewith it is capable of being rotated. Secured at or near the mid-length of this shaft is an eccentric, D, from which project two cams, E E', that are adapted to impinge against the lower ends of the vibrating jaws F F', the latter being pivoted to the housing at *f f'*. The upper and exposed ends of these jaws are adapted to vibrate in parallel planes, perpendicular to the saw-blade and the pitch distance apart, and are slotted at G G', so as to receive the bits H H', whose projecting spurs *h h'* act at the proper moment, to simultaneously set two adjacent teeth of the saw, one to the right and the other to the left. These jaws are adjusted toward the center of the machine, so as to impart a greater or less pitch to the teeth of the saw, by set-screw *g*, and are maintained securely in such position by the clamping-screws *g'*. In addition to the aforesaid slots, the jaws are also provided with jogs I I', for the support of beveled die-blocks J J', against which the blade rests while its teeth are being acted upon by the spurs *h h'* of the opposing bits. These beveled die-blocks are adjusted by the wedges K K'. As a portion of the bits H H' rest upon the beveled die-blocks, it will be seen that the screws *g'* act to maintain both the bits and beveled die-blocks in position. Longitudinal displacement of the beveled die-blocks is prevented by pins *k k'*, that enter recesses or slots *j j'*, on the under side of said beveled die-blocks. In order to support the saw at a proper height and allow it to be fed through the machine with comparative freedom, I provide two vises, L L', having slots *l l'*, for the reception of bolts M, that enable said vises to

be adjusted vertically on the housing B. These vises are guided in a vertical path by flanges *b' b''*. Each vise has a movable jaw, *m*, which is maintained in a closed position against the saw-blade by a spring, *m'*. Journaled within these vises is a bar, N, whose mid-length has an upwardly-projecting stump, *n*, which supports that portion of the saw directly under the beveled die-blocks, as clearly shown in Fig. 3.

The following arrangement of devices enables the saw to be fed through the machine in a regular and automatic manner: O is a feed hand or pawl, which is attached to a pivot, *o*, that is capable of being adjusted within the longitudinal slot *p* of a lever, P, which latter is pivoted at *q* to a lug, Q, projecting laterally from the housing B. R is a spring, which retracts the lever P, while its advance movement is effected by the eccentric D, which actuates said lever through the instrumentality of a rod, S. This rod is pivoted to the lower end of the lever, and passes through an aperture in the upper end of a stump, *s*, as represented in Fig. 2. A set-screw, T, regulates the stroke of lever P, so as to impart a greater or less movement of the feed-hand O. Secured to the lever P is a stop, U, which prevents the feed-hand being thrown back too far. V V' are India-rubber springs, interposed between the vibrating jaws F F' and the sides of the housing, for the purpose of opening said jaws at the proper moment; but, if preferred, spiral or plate springs may be substituted for the rubber ones.

The machine is operated in the following manner: The bits H *h* and H' *h'* and their respective die-blocks J and J' having been previously adjusted to their proper set and pitch, the vises L L' are first adjusted at a proper height, so as to bring the teeth of the saw in line with the bits H H', and the screw T is graduated in such a manner as to impart the necessary movement to the feed-hand O. These preliminary adjustments having been made, the saw-blade is then placed in position, and the shaft C rotated by the operator turning the handle *c'* of the fly-wheel *c*. The rotation of this shaft causes its cams E E' to impinge against and separate or spread apart simultaneously the lower ends of the jaws F F', and consequently to close the upper ends thereof, thereby bringing the bits H H' to bear against opposite sides of two contiguous teeth of the saw. As these bits and their opposing beveled die-blocks are sloped in opposite directions, it will be seen that the saw-teeth are set accordingly. As soon as the shaft C has completed half a revolution, the recessed portions *e e'* of the cams E E' are brought upward, and there being no longer anything to resist the stress of springs V V', the latter act instantly to close the lower ends of the jaws F F'. This closing of the lower ends of the jaws produces a corresponding opening of their upper ends, thereby relieving the saw-blade from the compression of the bits, and allowing said blade to be moved forward the distance of two teeth. This forward movement of the saw-blade is effected by the feed-hand O engaging with its teeth, and the effective stroke of said hand is accomplished the moment the bits have ceased to grasp said blade, and before they have had time enough to take hold of it again.

The rotation of the driving-shaft is continued until all of the teeth have been set in a perfectly uniform manner, as above described.

I claim as my invention—

1. A saw-setting machine consisting, essentially, of the housing B, driving-shaft C, cams E E' *e e'*, springs V V', and vibrating jaws F F' *f f'*, whose upper ends carry two pairs of bits, H H', and beveled die-blocks J J', occupying parallel planes at the pitch distance apart, for operating simultaneously and in opposite directions upon two contiguous teeth of a saw, as herein described and set forth.

2. In combination with the simultaneously-vibrating jaws F F', the bits H H' and beveled die-blocks J J', together with their adjusting and retaining devices G G', *g g'*, I I', and K K', substantially as explained.

3. The combination of the vertically-adjustable vises L L' M and bearing-bar N *n*, or equivalent devices, as and for the object stated.

4. The combination of the eccentric D and adjustable feeding mechanism O *o* P *p* Q *q* R S T, as herein described and set forth.

In testimony of which invention I hereunto set my hand.

GEO. W. BUGBEE.

Attest:

GEO. H. KNIGHT,
H. SCHOONMAKER.