(No Model.)

G. W. BUGBEE & F. DANNER.

SAW SET.

No. 338,161. Patented Mar. 16, 1886.

Fig. 1.

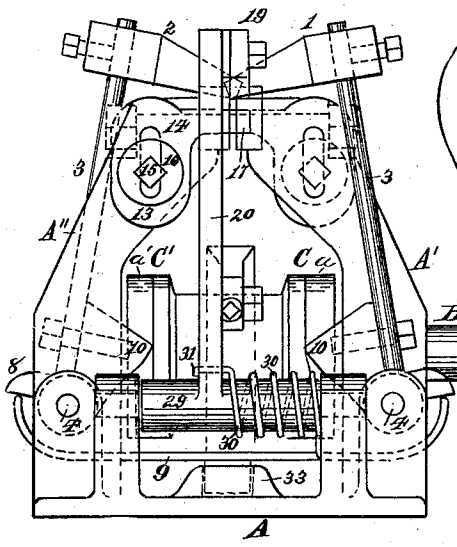


Fig. 2.

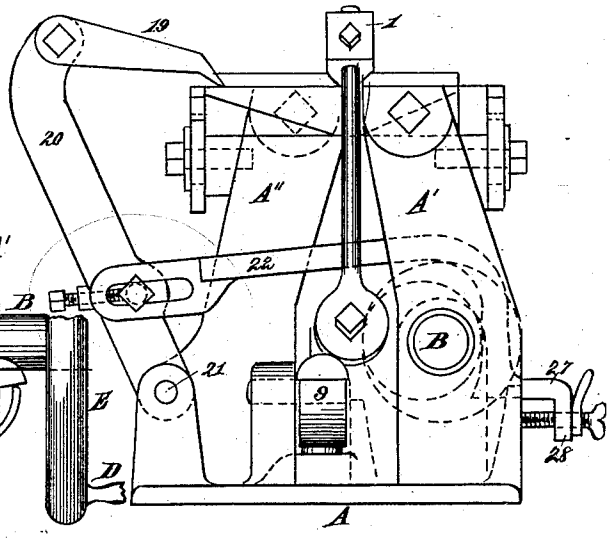


Fig. 3.

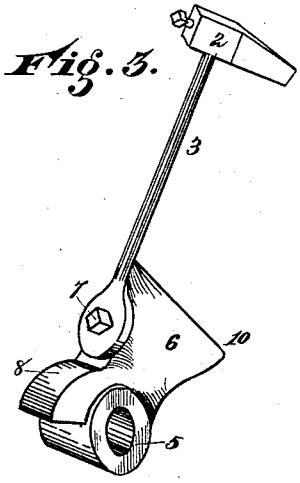


Fig. 4.

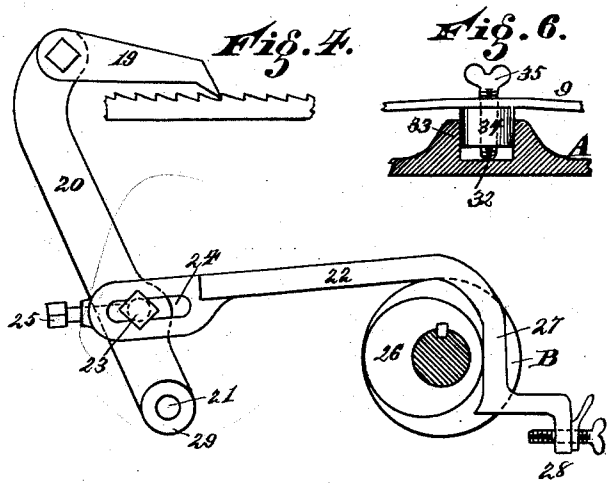
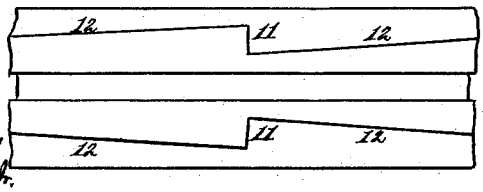


Fig. 6.

Fig. 5.



Attest

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UNITED STATES PATENT OFFICE.

GEORGE W. BUGBEE AND FREDERICK DANNER, OF CINCINNATI, OHIO, ASSIGNORS TO THE EGAN COMPANY, OF SAME PLACE.

SAW-SET.

SPECIFICATION forming part of Letters Patent No. 338,161, dated March 16, 1886.

Application filed December 5, 1885. Serial No. 184,822. (No model.)

To all whom it may concern:

Be it known that we, GEORGE W. BUGBEE and FREDERICK DANNER, residents of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Saw-Sets, of which the following is a specification.

Our invention relates particularly to an automatic saw-set.

The object of our invention is, first, to provide a saw-set which will automatically feed the saw and bend the alternate teeth in opposite directions by the striking of two hammers simultaneously on the opposite sides of the adjacent teeth.

Another object of our invention is to adjust the hammers laterally to the length of the teeth; and still another object of our invention is to provide means for adjusting the automatic feed to correspond with the length of the tooth, all of which will be fully set forth in the description of the accompanying drawings, making a part of this specification, in which—

Figure 1 represents an end elevation of our improvement. Fig. 2 represents a side elevation of the same; Fig. 3, a detail view of the hammer and mode of attaching it; Fig. 4, a detail view of the feeding apparatus; Fig. 5, a plan view of the face of the operating or driving cam; Fig. 6, a detail view of the spring-adjusting mechanism.

A represents the base of the frame; A′ A″, posts.

B represents a main shaft journaled to the posts.

C C′ represent two annular cams, which are formed on the inner faces of disks *a a′*, which disks are affixed to the shaft B and revolve therewith.

1 2 represent hammers, which are oscillated by shafts 3, journaled on center 4.

5 represents the sleeve-journal of the hammer-stocks; 6, ledges projecting up from the sleeve, to which the hammer-shafts are secured by a set-bolt, 7, which allows the hammer-shafts 3 to be adjusted radially on the set-bolt 7. This radial adjustment allows the faces of the hammers 1 2 to be brought nearer together or carried farther apart, so that the distance between them will correspond with the length of the teeth to be struck by the hammers.

8 represents a lug or cam on sleeve 5, with a radial face projecting outward and resting upon the end of a curved leaf-spring, 9.

The hammer-stocks, lugs, and adjusting features are each the counterpart of the other, and arranged to operate simultaneously on the opposite sides of the machine.

D represents a handle on fly-wheel E, which is turned to revolve shaft B and the cams C C′. The faces of the cams engage with the corners 10 of the ledges 6, and are arranged so that one portion of the revolution of the cams C C′ forces the hammer-shafts 3 and the hammers outward, causing them to open, ready for the blow. The outward movement of the shafts 3 and the lugs 8 upon the sleeve forces the ends of the spring 9 downward and outward. As soon as the corners of the lugs 10 come to the notches 11 (shown in Fig. 5) of the cams, they drop into the notches, and the force of the spring 9 causes the hammers to strike the saw-teeth, bringing the hammers into the position shown in Fig. 1.

12 represents the inclined planes of the cams illustrated by a plan view in Fig. 5. These inclines commence to diverge as soon as the hammers have made their strokes, and this divergence continues with the revolution of the cams C C′ until they have arrived at the point 11, when a second stroke is made, as before. The hammers 1 and 2 are secured to the shafts by a set-screw, so that they may be set up or down thereon to regulate the amount of set, or to regulate the strokes of the hammers to the thicknesses of the saw-blades. It is necessary to have the saw held in proper position and to be fed automatically between the strokes of the hammers 1 and 2. To accomplish this, we provide the following instrumentalities:

13 represents a bracket secured to post A″. It is provided with a slot, 14, through which passes a screw-bolt, 15.

16 represents a washer between the head of the bolt and the slot.

17 represents a ledge formed on the top of the bracket 13, which forms a rest to support

the saw. A similar bracket and ledge are attached to the opposite post.

Upon the opposite post, A′, is affixed a corresponding bracket and adjusting parts.

By means of the screw-bolts the bracket can be adjusted vertically, so as to hold the saw in the proper position relative to the faces of the hammers.

The feeding apparatus is as follows:

19 represents a pawl pivoted to arm 20. The point of the pawl engages with the saw-teeth and forces the saw along as the feed-arm 20 is oscillated.

21 represents the center on which arm 20 is journaled.

22 represents a connecting-arm secured to arm 20 by means of a screw-bolt, 23, passing through a slot, 24. This slot is made larger than the shank of the screw-bolt, and the bolt slides freely therein.

25 represents a set-screw passing through the head of the connecting-arm 22 and engaging against the edge of the arm 20, so that by turning the screw the stroke of feeding-arm 20 may be lengthened or shortened to regulate the throw of pawl 19, which rises automatically over the teeth and drops into position by gravity.

26 represents an eccentric on shaft B, between the cams C C′.

27 represents the bent shank of the connecting-arm 22, which drops down and engages against the periphery of the eccentric, so as to reciprocate the connecting-arm and oscillate the feeding-arm 20 as the cam 26 is rotated.

28 represents a set-screw for adjusting the shank of the connecting-arm to and from the eccentric.

29 represents a sleeve made integral with the arm 20.

30 represents a spring coiled around said sleeve, one end of which, 31, engages around the arm 20. The other end is firmly secured to the frame of the machine, so that as arm 20 is moved forward by the eccentric 26 the spring 30 is coiled, and its force draws the arms 22 and 20 backward preparatory to feeding the saw forward for operation of the hammers. The eccentric 26 again carries the arm 20 and pawl 19 forward to make a second feeding of the saw. These parts are adjusted so that the saw is fed along to its position in advance of the stroke of the hammers 1 and 2.

By means of the screw 25 herein shown the feeding-arm 20 and the pawl 19 can be adjusted to any desired length of throw, so as to accommodate the feeding motion to the length of the saw-teeth to be set by the hammers.

In order to adjust the tension of the spring 9 so as to give the desired strength of blow to the hammers, we have provided the following means:

32 represents the bottom of a recessed or cup-shaped lug, 33, with which the base of the machine-frame is provided, and 34 represents a block or plug seated in said recessed lug.

35 represents a screw passing through the spring 9 and tapping into block 34. The point of the screw bears upon the base of the frame. As the screw is turned to raise the block 34, the tension of the spring is increased as it curves up in the reverse direction in the center. By this means any amount of compression can be put upon the spring to give it the desired force.

We claim—

1. The hammer-shafts 3, secured to the hammer-stocks, journaled upon a center, and provided with lugs for compressing the spring to impart the force to the hammers, substantially as herein specified.

2. In combination with the two hammers placed on opposite sides of the frame, the cams, a spring, and the hammer-stocks journaled on centers and retracted by the engagement of lug 10 with the cams on shaft B, for a simultaneous stroke by the release of the spring 9, substantially as herein specified.

3. In combination with the hammer-stock 6, journaled on a center sleeve, the hammer-shafts 3, radially adjustable on said stock, substantially as herein specified.

4. In combination with the hammer-stocks, the shaft B and cams C C′, said stocks provided with lugs 8, for simultaneously compressing the free ends of the spring, which project up from opposite sides of the machine, to give a simultaneous stroke of both hammers, substantially as specified.

5. In combination with the hammers and table of a saw-set, the eccentric 26 and a connecting-arm, 22, having a bent shank engaging with said eccentric and adjustably pivoted to the oscillating arm 20, carrying an oscillating pawl, and the spring 30, whereby the feeding of the saw is automatically accomplished by rotating the main shaft, substantially as described.

6. In combination with the hammers and table of a saw-set, the oscillating feeding-arm 20, having a sleeve, 29, the coiled spring 30, wound around said sleeve and attached to the feeding-arm, the eccentric 26, and a connecting-arm, 22, having a bent shank engaged with said eccentric and adjustably pivoted to the feeding-arm, substantially as described.

7. In combination with the spring 9, operated by the lugs 8, the adjusting-screw 35, for regulating the tension of said spring, substantially as herein specified.

8. In combination with the spring 9, the adjusting-screw 35 and movable block 34, for regulating the tension of the spring, substantially as herein specified.

9. The combination, with a saw-support and the shaft B, having cams C C′, of the stocks journaled on centers 4 and provided with ledges 6 and cam-lugs 8 and 10, the hammer-shafts 3, adjustably attached to said ledges

6, and an adjustable spring, 9, adapted to engage the opposite lugs, 8, substantially as described.

10. The combination, with a saw-support, of the eccentric 26, oscillating feed-arm 20, carrying a pawl, 19, said feed-arm being provided with a pivotal sleeve, 29, a spring, 30, coiled on said sleeve and attached to the feed-arm, a connecting-arm, 22, provided at one end with a shank, 27, adapted to engage the eccentric, and having a slot, 24, at its other end, a bolt, 23, passed through said slot and forming a pivotal connection for the arms 20 and 22, and an adjusting-screw, 25, passing through the head of the connecting-arm and adapted to bear on the bolt 23, to limit the throw of the feed-arm, substantially as described.

In testimony whereof we have hereunto set our hands.

GEORGE W. BUGBEE.
FREDERICK DANNER.

Witnesses:
ROBERT ZAHNER,
M. E. MILLIKAN.