

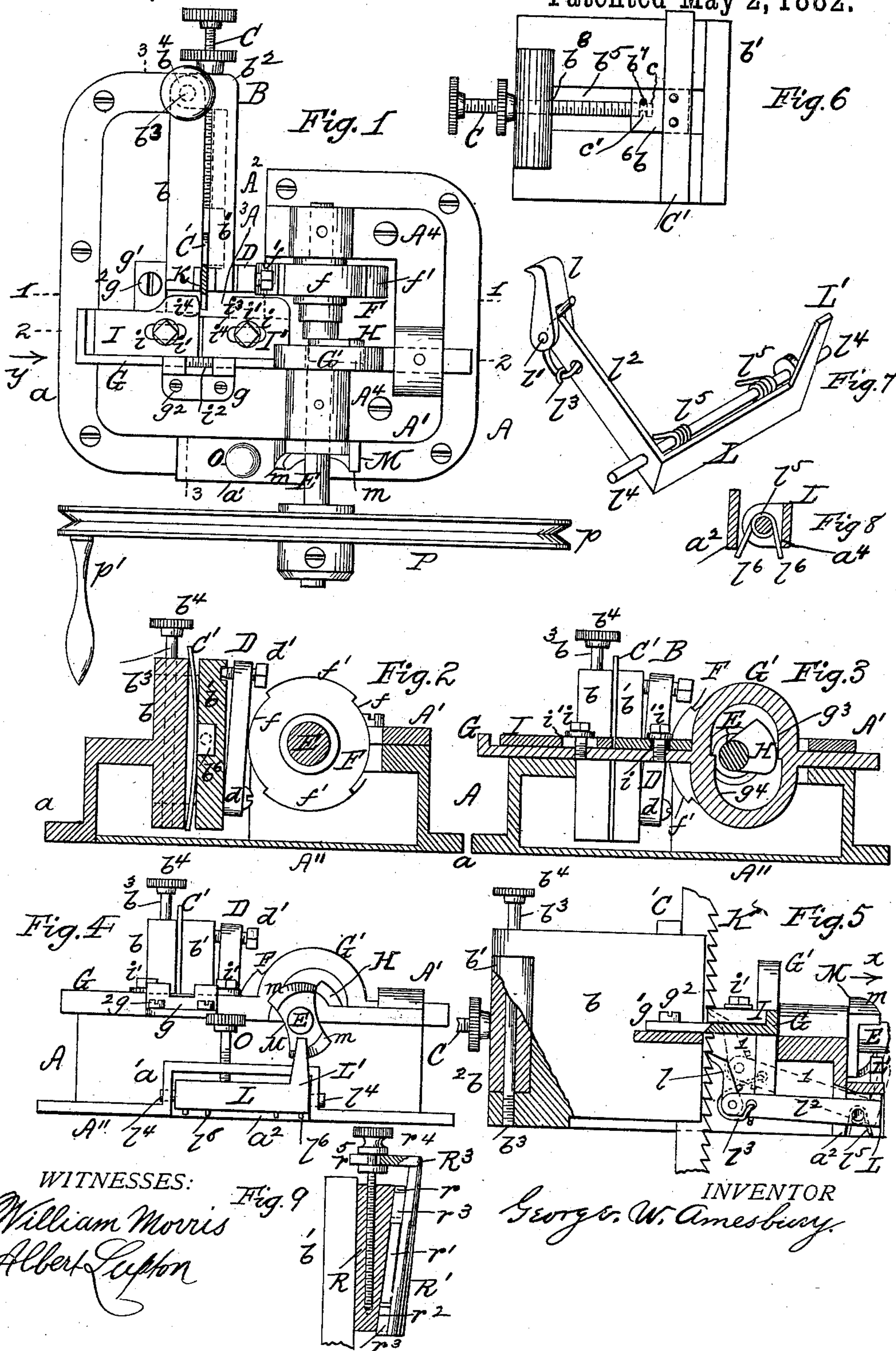
(No Model.)

G. W. AMESBURY.

SAW SETTING MACHINE.

No. 257,201.

Patented May 2, 1882.



UNITED STATES PATENT OFFICE.

GEORGE W. AMESBURY, OF PHILADELPHIA, PENNSYLVANIA.

SAW-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 257,201, dated May 2, 1882.

Application filed December 17, 1881. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. AMESBURY, a citizen of the United States, resident of the city and county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Saw-Sets, of which the following is a specification, reference being had to the annexed drawings, wherein—

Figure 1 is a plan of my invention. Fig. 2 is a section on line 1 1, Fig. 1. Fig. 3 is a section on line 2 2, Fig. 1. Fig. 4 is a front elevation. Fig. 5 is a section, partly in elevation, on the line 3 3, Fig. 1. Fig. 6 is an inside elevation of the movable jaw of the vise. Fig. 7 is a perspective of a part of the feeding devices. Fig. 8 is a detail cross-section of the same; and Fig. 9 is an elevation, partly sectional, of a detail modification.

My invention has relation to saw-sets, and is especially adapted for setting the teeth of band-saws.

It has for its object to provide a saw-set of compact form, extreme durability, capable of being easily operated, and which will efficiently set the teeth of saws with greater evenness or more uniform regularity and in less time than has heretofore been possible to do with the present form of saw-sets.

My invention accordingly consists of the combination, construction, and arrangement of parts, having reference particularly to the following features: first, to the combination of an automatically opening and closing vise or clamp for holding the saw to be set, an automatic device for feeding such saw, and reciprocating setting-dies; second, to the provision of a clamping-vise designed and adapted to close upon the saw and hold it in a fixed position during the setting operation, and to open and release the saw from any binding or clamping action during the feeding operation; third, to the provision of a rotary shaft provided with mechanism for effecting the opening and closing of the clamping-vise, the feeding of the saw, and the reciprocation of the setting-dies; fourth, to the provision of a reciprocating bar carrying two independent setting-dies, designed and adapted to be adjusted to and from each other, as hereinafter explained; and, fifth, to certain details of construction hereinafter more fully set forth and claimed.

Referring to the accompanying drawings, A represents the base or frame of the saw-set, and is provided with a closed lower side or bottom, A', having an L-shaped slot, A² A³, and also with a flange, a, through which pass screws to fasten the device to a bench or other suitable holder. b is a vertical elongated projection or lug, formed integral with said base, to serve as the stationary jaw of a vise or clamp, B, b' being the movable jaw thereof, and which is hinged or pivoted to jaw b, at b², by a pintle, b³, provided with a milled head or knob, b⁴, so that said pintle may readily be removed to effect disengagement of said jaws b and b' when from any cause it is desirable to separate such parts. The jaw b' is provided with an elongated central recess, b⁵, which receives a block, b⁶.

C is a screw-rod provided with milled head and jam-nut, and passes through a threaded opening, b³, in jaw b', and enters recess b⁵. The end c of rod C is provided with an annular groove, c', so that when said end is passed into an opening in block b⁶ and the pin b⁷ inserted therein to pass across said groove c' a swiveled connection will be formed between said block and screw-rod. Hence when the latter is turned the block b⁶ will be slid to and fro in recess b⁵. To said block is riveted or otherwise secured a metal strip, C', which stands in a vertical position between said jaws, to form a gage and support for the back or rear edge of the saw to rest upon and bear against, as shown in Fig. 5. Said gage is made of steel or other spring metal, and is slightly bowed, as illustrated, so that when the jaws b and b' are closed together, as hereinafter set forth, said gage will be flattened out, and when such jaws are free to open the reaction of the spring-gage C' will thereupon open said jaws. The bow-shaped gage C' also prevents the saw passing between it and the jaws of the vise when the latter is opened.

D is a bearing-bar, secured at d to movable jaw b', and is provided at its upper end with a screw, d', whereby said end is adjusted to and from the jaw b'.

E is the driving-shaft, having bearings in base A and cap A', as shown. Upon said shaft is rigidly secured a wheel, F, mutilated at f f' to form cams f' f'. Said wheel is located upon

said shaft so as to be in line with bearing-bar D, against which the cams f' f' impinge when said shaft is rotated. Such impingement of the cams f' f' against bar D causes the latter to be moved to the left to effect the closing of the jaw b' to compress gage C' and clamp or bind the saw placed between jaws b and b' and hold it firmly in position during the setting operation. When the cams f' f' leave the bar D the latter and jaw b' are free to move to the right, or away from jaw b , and such movement is accomplished by the reaction of spring-gage C' , or the gage C' may not be depended upon to open said jaws; but such movement may be accomplished by the reaction resulting from the compression of the saw-blade. In such case the gage C' acts only to keep the blade in its proper position within the jaws of the vise.

G is a bar or frame resting upon the base A, and is held in position by fingers g and g' , secured to said base by screws g^2 on opposite sides of said bar, as shown. Said fingers form guides between which said bar slides. The bar G is formed with a yoke, G' , through which shaft E passes, and H is a cam or eccentric secured to said shaft within said yoke, so that as said shaft is revolved the cam H will alternately contact with the sides g^3 g^4 of the yoke G' to reciprocate bar G and the setting-dies I and I' placed thereon. Said dies are each provided with slots i i , through which pass screws i' i' , whereby said dies are secured to bar G. When desired the dies may be adjusted to and from each other by loosening screws i' i' , the amount of such adjustment being conveniently ascertained by inspection of the scale i^2 marked on bar G, as illustrated. The die I' is cut away at one corner, as shown at i^3 , and into the opening formed thereby project the teeth of the saw K, placed in vise B, as shown in Fig. 1, said opening i^3 being also provided for permitting the necessary reciprocating movement of the dies. As shaft E is turned the cam H reciprocates bar G and dies I and I', so that the setting-edges i^4 i^4 of said dies alternately strike the saw-teeth on opposite sides of the saw to set the same.

l is the feeding dog or pawl, pivoted at l' to arm l^2 , and is provided with spring l^3 , the tendency of which is to keep said dog in contact with the saw-teeth designed to be set. The arm l^2 is secured to or forms an integral part of a bar, L, pivoted at l^4 in the front side, a' , of base A, as shown. Upon such pintle-shaft l^4 is placed a spring or springs, l^5 , the ends l^6 of which bear against side a^4 of bar L and a ledge, a^2 , formed on frame A, as more plainly shown in Fig. 8. The action of springs l^5 is such that the arm l^2 of bar L is thereby depressed to cause dog l to descend in order to get into position below the next succeeding tooth designed to be fed to the setting-dies. Said dog is caused to ascend and feed such tooth to the dies through the instrumentality of the following means:

M is a wheel fixedly secured to shaft E, and upon the face of which are formed inclines or cams m m . From bar L projects a finger or stud, L' , and is situated in the path of movement of cams m m , so that when shaft E is revolved the cams m m strike or bear against stud L' , moving it outwardly or away from the side a' , as indicated by arrow x in Fig. 5, rocking bar L on its pintle l^4 to raise arm l^2 and dog l to position indicated by dotted lines 1 1, Fig. 5, and thereby causing said dog to feed the next succeeding saw-tooth to the dies.

O is an adjusting-screw for limiting the amount of rocking of bar L, and thereby vary the extent of movement of arm l^2 and dog l in feeding saws of different sizes or lengths of teeth.

P is a driving-wheel, which, if desired, may have a peripheral groove, p , for a belt when it is designed to operate the saw-set by power; or a handle, p' , may be secured thereto for manual operation.

The operation is as follows: The various parts being arranged for operation substantially as illustrated, with the various adjustments regulated to correspond with the thickness of the saw-blade and the length of the teeth, power is applied to shaft E, and the cam-wheels F M and cam or eccentric H simultaneously rotated; but these cams are so arranged on said shaft with respect to one another that the opening and closing of the vise, the reciprocation of the dies I and I', and the feeding of the saw take place successively or in uniform rotation. For instance, if the dies I and I' be moving in the direction indicated by arrow y , Fig. 1, the vise B is closed by reason of one of the cams f' being in impingement with bar D, and the setting-edge i^4 of die I is about to strike the saw to set a tooth. When such action has been effected the cam f' has moved out of contact with bar D, whereupon the reaction of compressed spring-gage C' or saw K then opens said vise. Meanwhile one of the cams m on wheel M has moved stud L' to rock lever L and cause dog l to rise to feed the next successive saw-tooth into the line of movement of the dies, such feeding taking place the moment the vise B is opened, so that the binding or clamping action thereof being removed from the saw, the latter is free to move when so actuated by the feeding-dog. As soon as such feeding is effected the vise B is again closed by impingement of the remaining cam f' with bar D, and the bar G then making its return-stroke, the setting-face i^4 of die I' strikes said tooth so fed, but on the opposite side of the saw to that previously done by the die I. Hence every two teeth of the saw are reversely set by such movement of the dies. After die I' completes such setting the vise opens. The next succeeding tooth is then fed or raised, the vise again closes, and die I is moved to set such tooth, as above set forth. Hence during every revolution of the driving-shaft the vise opens and closes twice. Two

teeth of the saw are fed to and are reversely set by the reciprocating dies. All of such movements being automatically accomplished, no skill is required on the part of the operator for setting saws with my invention.

It will be noticed that the cap A' is so formed that it partially provides a bearing for both ends of the driving-shaft and for one end of the reciprocating bar G , and is held in position by screws A^4 A^4 .

In Fig. 9 I have shown a modification of the bearing-bar D , such modification being used where greater nicety and longer range of adjustment are designed to be given to said bar. In said figure the jaw b' is shown as having an inclined lug, R , cast thereon, which is formed with a dovetail slot, r , and recess r' .

R' is a slide formed with inclined edge r^2 , upon which is formed a dovetail, r^3 , which passes into slot r of lug R . Said slide R' is provided with an adjusting-screw, r^4 , having a grooved collar fitting in a slotted finger or bracket, r^5 , formed on or secured to lug R^3 . As said screw r^4 is turned the slide R' is moved up or down, and during such movement its inclined side causes it to approach to or recede from the cam-wheel F .

The above-described saw-set can be used to set the teeth of band, circular, jig, hand, and other saws.

What I claim as my invention is—

1. In a saw-set, the combination of a rotary shaft, a vise composed of a fixed and a movable jaw, the latter being provided with an adjustable bearing-bar acted on by a cam-wheel secured to said shaft, and a feeding device controlled by mechanism substantially as shown and described, and operated by a cam-wheel, also secured to said shaft, substantially as and for the purpose set forth.

2. In a saw-set, the combination, with a rotating shaft, of a vise composed of a fixed and a movable jaw, the latter being provided with an adjustable bearing-bar designed and adapted to be acted on by a cam-wheel on said shaft, whereby said jaw is closed upon the fixed jaw, substantially as shown and described.

3. In a saw-set, the combination, with a revolving shaft, of a vise having one of its jaws provided with an adjustable bearing-bar, substantially as shown and described, and designed and adapted to be acted on by a cam-wheel upon said shaft and an interposed plate or spring between such jaws, whereby when said shaft is rotated the jaws of the vise are closed upon and released from the saw, substantially as shown and described.

4. In a saw-set, the combination of a base or frame to which is attached the fixed jaw of a vise, the movable jaw being pivoted to said fixed jaw and provided with a bearing-bar, which abuts against a cam-wheel secured to a rotary shaft, substantially as shown and described.

5. A saw-set provided with a rotary shaft, a vise having a fixed and a movable jaw, the

latter having a bearing plate or bar which abuts against a cam-wheel on said rotary shaft, in combination with an adjustable spring-gage interposed between the vise-jaws, substantially as and for the purpose set forth.

6. In a saw-set, the combination of a vise provided with an adjustable bearing-bar and an adjustable spring-gage, a cam-wheel, a rotary shaft, and setting and feeding devices, substantially as set forth.

7. In a saw-set, the combination of a vise provided with a bearing-bar designed and adapted to be acted upon by a cam-wheel on a rotary shaft, a die carrying or holding frame located in front of said vise and meshing with a cam or crank located upon said rotary shaft, whereby said die-carrying frame is caused to reciprocate in front of said vise, as set forth.

8. In a saw-set, the combination of a vise, a rotary shaft, a cam fastened on said shaft and designed to close the movable jaw of the vise, a reciprocating die-holding frame or bar, a feed-dog located beneath said bar and in front of the vise, an oscillating bar, and an actuating cam-wheel for said bar secured to said shaft, substantially as shown and described.

9. In a saw-set, the combination of a rotary shaft, a saw holding or clamping device composed of a fixed and a movable member, the latter being designed to be closed by a cam-wheel fastened on said shaft, and a reciprocating frame or bar operated by a cam or crank secured to said shaft, said bar carrying adjustable setting-dies, substantially as shown and described.

10. In a saw-set, the combination of a vise, a bearing-bar therefor in engagement with a cam-wheel on a rotary shaft, a reciprocating die-holding bar operated by a crank or cam on said shaft and carrying adjustable setting-dies, and a feed-dog controlled by an oscillating bar operated by a cam on said shaft, substantially as shown and described.

11. In a saw-set, a base or frame, A , a rotary shaft, E , a reciprocating bar, G , and a U-shaped cap, A' , constructed to form bearings for both ends of said shaft and for one end of said bar, substantially as shown and described.

12. In a saw-set, the combination of a rotary shaft having a cam-wheel which closes the movable jaw of a vise located parallel with said shaft, and a reciprocating die-holding bar arranged at right angles with said shaft and vise, and which is designed and adapted to be moved by a crank or cam secured on said shaft, substantially as shown and described.

13. In a saw-set, the combination of a vertically-arranged vise, its movable member being closed by a cam-wheel fastened to a rotary driving-shaft, a reciprocating die-holding bar operated by a cam or crank, also secured to said shaft, and feeding mechanism constructed and arranged substantially as shown and described.

14. The combination of base A , vise B , hav-

ing fixed jaw *b* and movable jaw *b'*, spring-gage *C'*, provided with adjusting-screw, bearing-plate *D*, shaft *E*, carrying cam-wheel *F*, substantially as shown and described.

5 15. In combination with a saw-holding vise or clamp and cam-wheel, *F*, a bar, *G*, provided with a yoke, *G'*, and adjustable setting-dies *I* and *I'*, shaft *E*, and eccentric or cam *H*, substantially as shown and described.

10 16. In a machine for setting band-saws, a reciprocating bar carrying two setting-dies, which are rigidly secured thereto, and designed and adapted to be adjusted to and from one another by a sliding movement along or on
15 said bar, the latter being operated by a cam or crank motion, substantially as shown and described.

20 17. In combination with a saw-holding vise or clamp and a setting device, the feed-dog *l*, bar *l'*, frame *L*, pivoted at *l''* to base *A*, stud *L'*, cam-wheel *M*, rotating shaft *E*, substantially as shown and described.

18. The combination of base *A*, rotating shaft *E*, carrying cam *M*, stud *L'*, secured to pivoted frame or bar *L*, and adjusting-screw
25 *O*, substantially as shown and described.

19. In a saw-set, the combination of a rotary shaft, carrying a cam-wheel actuating an opening and closing vise or clamp, a reciprocating die-holding frame operated by a crank
30 or cam on said shaft, and a feeding-dog pivoted to an oscillating bar carrying a retracting-spring, said bar being operated by a cam-wheel secured to said shaft, substantially as
35 shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 12th day of December, 1881.

GEORGE W. AMESBURY.

Witnesses:

CHAS. F. VAN HORN,
WILLIAM MORRIS.