

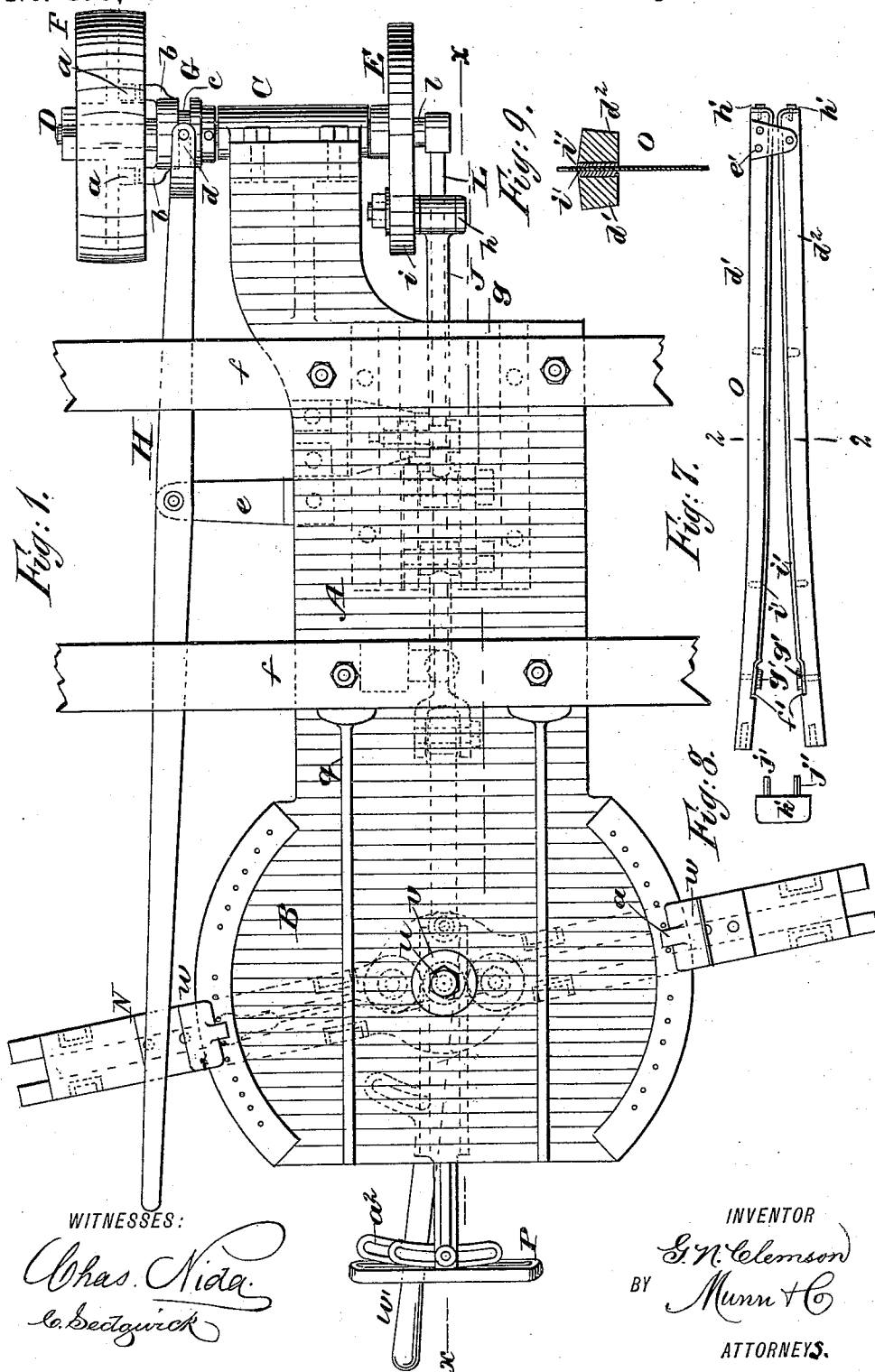
(No Model.)

2 Sheets—Sheet 1.

G. N. CLEMSON.
SAW FILING MACHINE.

No. 473,294.

Patented Apr. 19, 1892.



WITNESSES:

Chas. Nida
C. Sedgwick

INVENTOR

G. N. Clemson
BY Munn & Co

ATTORNEYS.

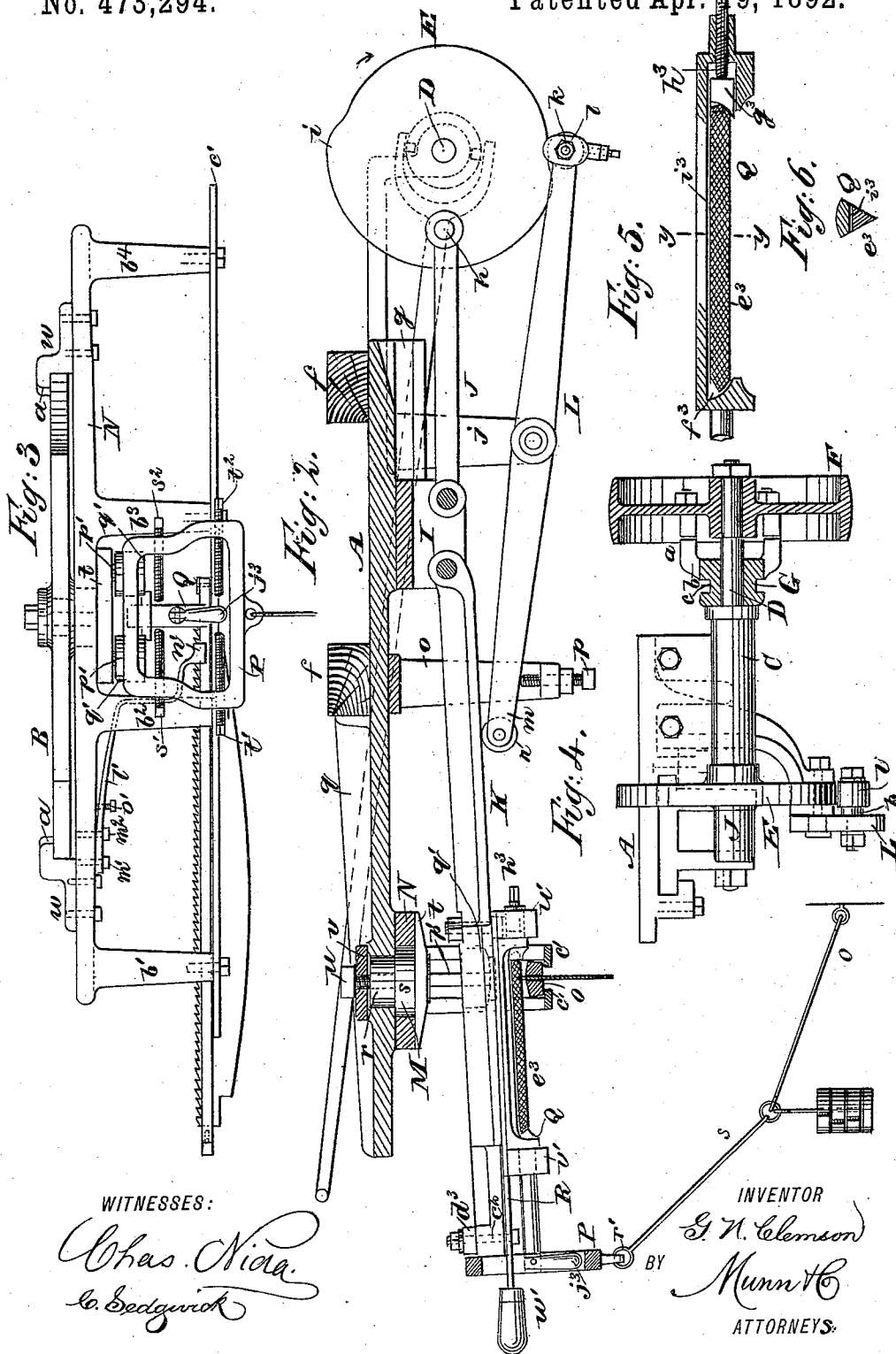
(No Model.)

2 Sheets—Sheet 2.

G. N. CLEMON.
SAW FILING MACHINE.

No. 473,294.

Patented Apr. 19, 1892.



WITNESSES:

Chas. Nida.
Co. Sedgwick

INVENTOR

G. N. Clemon

BY

Munn & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

GEORGE N. CLEMONS, OF MIDDLETOWN, ASSIGNOR TO THE NATIONAL SAW COMPANY, OF NEW YORK, N. Y.

SAW-FILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 473,294, dated April 19, 1892.

Application filed September 26, 1891. Serial No. 406,884. (No model.)

To all whom it may concern:

Be it known that I, GEORGE N. CLEMONS, of Middletown, in the county of Orange and State of New York, have invented a new and Improved Saw-Filing Machine, of which the following is a specification, reference being had to the annexed drawings, forming a part thereof, in which—

Figure 1 is a broken plan view of my improved saw-filing machine. Fig. 2 is a longitudinal section taken on line *xx* in Fig. 1. Fig. 3 is a front elevation. Fig. 4 is a rear elevation, partly in vertical section. Fig. 5 is an enlarged side elevation of the file-holder. Fig. 6 is a transverse section taken on line *yy* in Fig. 5. Fig. 7 is a detail plan view of the vise. Fig. 8 is a plan view of the staple for holding the jaws of the vise, and Fig. 9 is a transverse section taken on line *zz* in Fig. 7. Similar letters of reference indicate corresponding parts in all the views.

The object of my invention is to construct a saw-filing machine in which the front edge of one tooth and the back of the adjacent tooth will be filed simultaneously and in which the stroke of the file will feed the saw one or more teeth, as may be required.

My object is also to provide means for turning the file and adjusting the saw at the proper angle, and, further, to provide a file-holder for retaining the file in the position for use.

My invention consists in the combination, with a frame carrying the file-reciprocating mechanism, of a pivoted guide for receiving and guiding the saw while undergoing the operation of filing, a reversible file-holder, and mechanism for reversing the file so as to change its angle to adapt it to file teeth passing in opposite directions through the machine; also, for changing the angle of the file with reference to its longitudinal movement, so as to cause it to feed the saw at opposite angles during its working movements.

The frame A of the machine is preferably formed integrally of a single casting, with a segmental disk B at the front end and a journal-box C at the rear end for receiving the driving-shaft D. Upon the end of the driving-shaft D, about opposite the center of the

body of the frame A, is secured a crank-disk E, and upon the opposite end of the shaft is loosely placed a pulley F, provided with clutch-lugs *a a*. Upon the shaft D, between the pulley F and the journal-box C, is placed a clutch G, which is arranged to slide longitudinally on the shaft, but is prevented from turning thereon by a feather in the clutch entering a groove in the shaft.

The clutch G is furnished with lugs *b b*, adapted to engage the lugs *a*, and is provided with a circumferential groove *c* for receiving the fork *d* of the clutch-operating lever H, the latter being pivoted to an arm *e*, projecting from the side of the frame.

The under side of the rear portion of the frame A is furnished with guides *g*, which receive the slide I, the rear end of which is connected by a connecting-rod J with the crank-pin *h* of the crank-disk E. To the forward end of the slide I is pivoted the file-carrying bar K. In the periphery of the crank-disk E is formed a cam *i*, which extends over about one-half the circumference of the crank-disk, the said cam being constructed with inclines at opposite ends, with an intermediate portion concentric with the crank-disk. As the cam *i* is designed for lifting the file from the saw during the return stroke of the file, it is arranged to lift the file just before the beginning of the return stroke thereof and to hold it in an elevated position until the return stroke is completed, as will presently be described.

To an arm *j*, extending downward from the frame A, is pivoted a lever L, the rear arm of which extends rearwardly to a point about opposite the shaft D, while the forward arm extends underneath the rear portion of the file-carrying bar K. The rear end of the lever L is slotted to receive the stud *k*, which is provided with a shoulder and a nut for clamping it in any desired position in the slot. Upon the said stud *k* is placed a friction-roller *l*, which bears upon the periphery of the crank-disk E. The forward arm of the lever L is provided with a fork *m*, in which is journaled a roller *n*, which bears upon the under surface of the bar K.

To the under side of the frame A is secured

an arm *o*, the lower end of which is bent at a right angle and provided with a thumb-screw *p* for limiting the downward movement of the forward arm of the lever *L*.

5 In the center of the segmental disk *B* is formed a circular aperture for receiving the stud *M*, which is made in two diameters *r s*, the part *r* fitting into the central aperture of the segmental disk and the part *s* fitting a
10 hole in the center of the pivoted cross-arm *N*, the said cross-arm being supported by the flange *t* on the lower end of the stud *M*. The said stud *M* is held in place in the aperture in the segmental disk by a tap-bolt *u*, extend-
15 ing through a roller *v*, resting on the top of the segmental disk and into a threaded hole in the stud. The cross-arm *N* extends in both directions beyond the periphery of the seg-
20 mental disk, and is provided at opposite edges of the disk with clips *w w*, which extend up-
wardly and over the edges of the disk. The said clips are each provided with a central stop *a*, and in the segmental disk *B*, near the
25 opposite edges, are drilled a series of holes for receiving the stop-pins for limiting the move-
ment of the arm *N*. The arm *N* is provided with four pairs of downwardly-projecting
30 arms *b' b² b³ b⁴*, to which are secured guides *c' c'*, one guide being attached to the lower end of one of each pair of arms *b' b²*, &c., the other being secured to the other arm of each pair.

On the guides *c' c'* rests the saw-holding vise *O*, which passes between the pairs of
35 arms *b' b² b³ b⁴* and rests upon the guides *c'*. The saw-holding vise *O* is shown in detail in Figs. 7 and 9. It consists of a pair of connected curved bars *d' d²*, preferably pivotally
40 connected together, the bar *d'* being provided with ears *e'*, which reach over the bars *d²* and receive a pivotal pin, which also passes through the bar *d²*. The convex faces of the
45 bars *d' d²* adjoin each other, and in these faces near the free ends of the bars are formed recesses *f'* for receiving the screws *g'*, and in the pivoted ends of the bars *d' d²* are inserted
screws *h'*. The adjoining faces of the bars are each provided with a pliable lining *i'*, which
50 is secured in its place at one end by the screw *g'* in the recess *f'*, and extends along the convex face of the bar to the opposite end, where it is fastened by the screw *h'*, extending
55 through a hole in the lining and into a threaded aperture in the end of the bar. The lining is further secured by wooden pegs driven through it into holes through the bar at suitable intervals. The free ends of the bars are drilled lengthwise to receive the studs *j'*, project-
60 ing from the fastening-block *k'*.

The bars *d' d²* are made of spring material, preferably steel, and the saw is clamped between the jaws by swinging the free ends to-
65 gether by any suitable means after the saw is inserted between them, then inserting the studs *j'* in the holes in the free ends of the bars. By this construction a uniform pressure is created upon opposite faces of the saw

throughout its entire length, so that the saw is securely held while undergoing the opera-
70 tion of filing without liability to undue vibration along any portion of its length. The edges of the outer sides of the bars *d' d²* are beveled to cause them to touch the guides along their upper edges to insure a firm bearing
75 of the vise in its guides during the operation of filing.

To the under surface of the pivoted cross-arm *N* is secured a spring *l'* by means of the screws *m' m²*, which pass through the flattened
80 end of the spring. The body of the spring is preferably made round in cross-section, so that it is operative in two directions. The free end of the spring is curved downwardly and furnished with an angled end piece *n'*,
85 which extends over the upper corner of the vise *O*, and tends to hold the vise down upon the guides *c'* and press it against its bearings in the direction in which it would be drawn by the action of the file. An adjusting-screw
90 *o'*, inserted in the spring *l'*, bears against the under surface of the pivoted cross-arm *N*, and in connection with the screw *m²* is used for adjusting the spring.

In the head *t* of the stud *M* are inserted studs *p'*, upon which are placed rollers *q'*,
95 which serve as guides to the bar *K*, the said rollers having vertical play on the studs *p'*. The forward end of the bar *K* projects beyond the guides *c' c'* and carries a frame *P* of substantially rectangular form, which is provided
100 with an eye *r'* for receiving a weight-rod. In opposite ends of the frame are inserted adjusting-screws *s' s²* and *t' t²*, which extend inwardly toward the center of the frame. In the bar *K*, behind the guides *c' c'*, is inserted
105 a stud *u'*, having a cylindrical shank made in two diameters, the smaller part of which enters a hole in the bar and is adapted to turn therein, while the part of the larger diameter is below the under surface of the said bar *K*
110 and the lower portion of the stud is made square in section and bored transversely for receiving the rear journal of the file-holder *Q*.

The front journal of the file-holder *Q* is received in an apertured block *v'*, secured to a
115 swinging bar *R*, the rear end of which is apertured and received on the stud *u'* between the square head and the bar *K*. The bar *R* extends through the frame *P* and is provided with a handle *w'*. The bar *R* is provided
120 with a curved slotted cross-arm *a²* for receiving the friction-bolts *c²*, which extend upwardly through the forward end of the bar *K* and through a rubber spring *d³*, where it is provided with a nut and washer. By the
125 pressure placed upon the bar by means of this bolt it is made to retain its position after being moved.

The file-holder *Q* (shown in enlarged detail in Fig. 5) consists of a bar cut away upon one
130 side, forming a recess for receiving the file *e³*. At one end of the said recess is formed a cavity *f³*, having an undercut V-shaped surface for engaging the pyramidal end of the file.

The opposite end of the holder is furnished with a follower g^3 , having a beveled end provided with a V-shaped groove for receiving the opposite end of the file. In the journal which extends through the stud u' is inserted a set-screw h^3 , which bears against the follower g^3 , so that when a file is placed in the holder, with one end in the cavity f^3 and the other end against the follower g^3 , the forward movement of the follower g^3 , effected by turning the screw h^3 , clamps the file securely at its ends and at the same time forces it up against the bearing-surface v^3 . The file e^3 used in this case is triangular in cross-section, one end being beveled off from each side to give it a pyramidal form; but I do not limit myself to a file of this shape. The journal of the file-holder which passes through the block v' extends into the frame P, where it is provided with a downwardly-extending arm j^3 , the lower end of which is located between the ends of the screws $t' t^2$. The swinging bar R extends outwardly between the adjusting-screws $s' s^2$. The distance between the screws $s' s^2$ determines the amount of longitudinal displacement of the saw for each working stroke of the file, while the space between the inner ends of the screws $t' t^2$ and the center of the bar K determines the inclination or angle of one tooth, while the angle formed by the pivoted cross-arm N with the file-carrying bar K determines the bevel of the tooth. The arm N being set to secure the required bevel in one direction, a pin is inserted in one of the holes in the segmental disk B, which will limit the motion of the cross-arm in one direction, and a pin is inserted in a corresponding hole in the opposite edge of the segmental disk to limit the motion of the arm when swung in the opposite direction. The swinging bar R being adjusted to give the file e^3 the proper angle for feeding the required number of teeth for each movement thereof, and a weight-rod S being weighted to give the file the required pressure, the machine is set in motion. The movement of the bar K by the revolution of the crank will cause the file e^3 to be passed between a pair of teeth of the saw, filing the back of one tooth and the front of the adjacent tooth, at the same time by its diagonal arrangement causing the saw to move the required distance. As soon as the file reaches the end of its stroke the roller l on the rear end of the lever L is engaged by the cam i , pressing down the rear end of the lever, causing the front end to engage the bar K, lifting the said bar so as to release the file from the saw, and while the file is held in elevated position by the cam the crank completes the movement of the bar K, returning the file to the point of starting when the roller l of the lever L follows the cam, allowing the file to drop into the saw and repeat the operation just described as the crank disk continues to turn.

If the saw is a cut-off saw, alternate teeth are filed during the passage of the saw through

the machine. When the first half of the filing is done, the arm N is reversed, the saw is removed and reversed, and the handle w' is moved so as to shift the angle of the file with reference to its path, and the engagement of the arm j^3 with one of the screws $t' t^2$ turns the file through a part of a revolution, so as to reverse it for filing the intermediate teeth. The machine being again set in motion, the intermediate teeth are filed, thus completing the work.

When the saw is a rip-saw, the file-holder is adjusted at such an angle as to move the saw only one tooth at a time, as the cutting-edges of the teeth are substantially at right angles to the plane of the saw.

It will be observed that the filing of the teeth is effected by single strokes of the file. Where this is found insufficient to bring the teeth to the proper form, the saw is passed a second time through the machine.

As the pressure of the file upon the edge of the saw is produced by gravity, it will be seen that a saw with a convex edge may be filed as readily as one having a straight edge. After the filing operation is completed the vise O is removed from the machine and the free ends of the bars $d' d^2$ are forced together, the fastening-block k' is removed, and the filed saw is taken out.

In the operation of filing, as the file is drawn across the edge of the saw the vise O is prevented from tilting by the engagement of its upper edge with the guides and by the spring l' .

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a saw-filing machine, the combination of the reciprocating bar K, supported pivotally at one end, the swinging bar R, pivotally connected with the reciprocating bar K, the revoluble file-holder Q, supported by the bar R, and means, substantially as described, for automatically turning the file-holder Q when the angle of the bar R is changed.

2. In a saw-filing machine, the combination of the reciprocating bar K, supported pivotally at one end, the swinging bar R, pivotally connected with the reciprocating bar K, the revoluble file-holder Q, supported by the bar R, means, substantially as described, for automatically turning the file-holder Q when the angle of the bar R is changed, a freely-moving saw-holder O, adapted to be slid by the engagement of the file with a saw, and supports and guides for the saw-holder, substantially as specified.

3. In a saw-filing machine, the combination of the reciprocating bar K, supported pivotally at one end, the swinging bar R, pivotally connected with the reciprocating bar K, the revoluble file-holder Q, supported by the bar R, means, substantially as described, for automatically turning the file-holder Q when the angle of the bar R is changed, a freely-moving saw-holder O, adapted to be slid by the

engagement of the file with a saw, supports and guides for the saw-holder, and means for raising and lowering the file-carrier, substantially as specified.

5 4. A vise for holding a saw while being filed, the same consisting of a pair of inwardly-convex spring-jaws connected at one end and a fastener for holding the jaws in a closed position, substantially as specified.

10 5. A vise for holding a saw while being filed, the same consisting of a pair of inwardly-convex spring-jaws connected at one end, a fastener for holding the jaws in a closed position, and a pliable jaw-lining, substantially as specified.

15 6. In a saw-filing machine constructed to file one notch of the saw with a single stroke of the file, the combination of a reciprocating bar pivoted at one end, a swinging bar pivoted to the reciprocating bar, a revoluble file-

holder carried by the swinging bar, an adjustable saw guide and holder, and mechanism for raising the file-carrier at the end of its working stroke and lowering it at the beginning of its working stroke, so as to bring the file in contact with the edge of the saw, substantially as specified. 25

7. In a saw-filing machine constructed to file one notch of the saw with a single stroke of the file, the combination of the frame provided with segmental disks, the saw-guide cross-arm, the saw-vise guides carried by the cross-arm, and means for simultaneously filing the saw and moving it forward into a new position, substantially as specified. 30

GEO. N. CLEMONS.

Witnesses:

JOSEPH F. ROBINSON,
WILLIAM D. BROWN.