J. Lough,

3. Sheets. Sheet. 1

Saw Sharge.

No. 111,953. Patented Feb. 21. 1871.

Fig. 1.

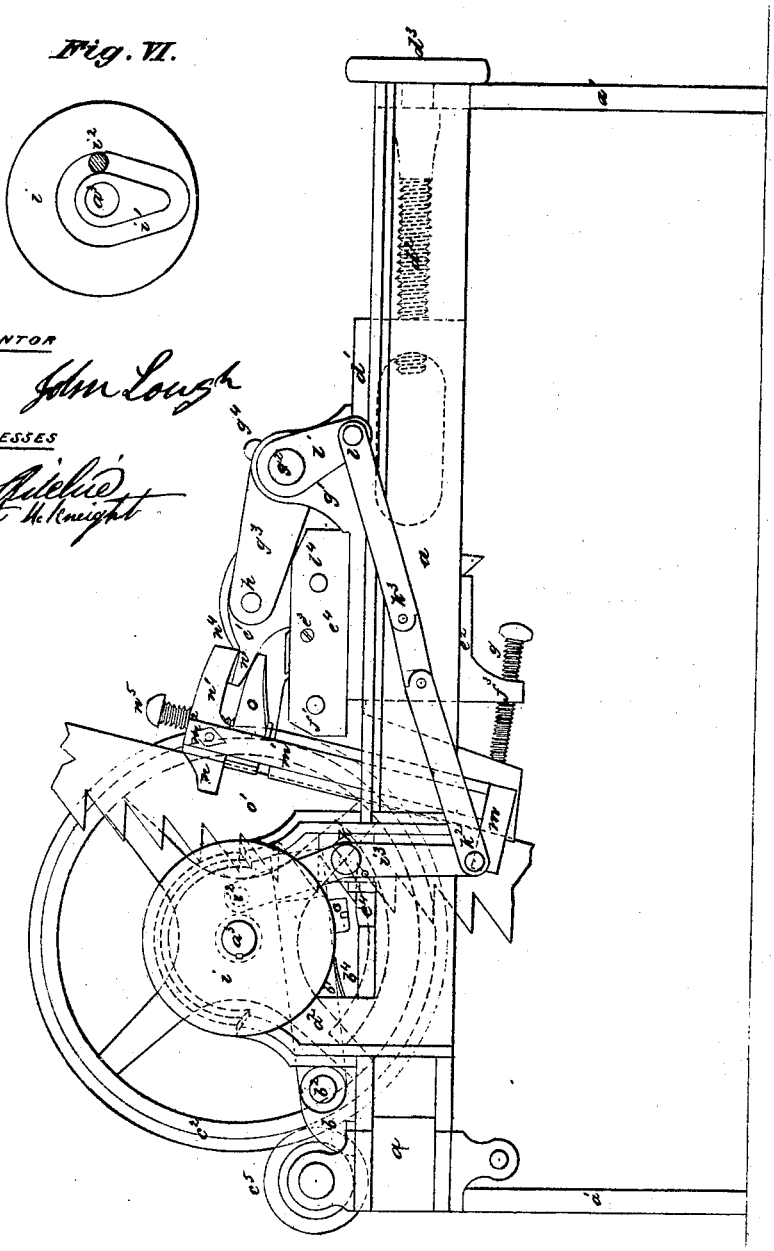


Fig. VI.

INVENTOR

John Lough

WITNESSES

Wm. Ridelice

Robert McKnight

3 Sheets, Sheet 2.

J. Lough,

Saw Swage.

No. 111,953. Patented Feb. 21. 1871.

Fig. IV.

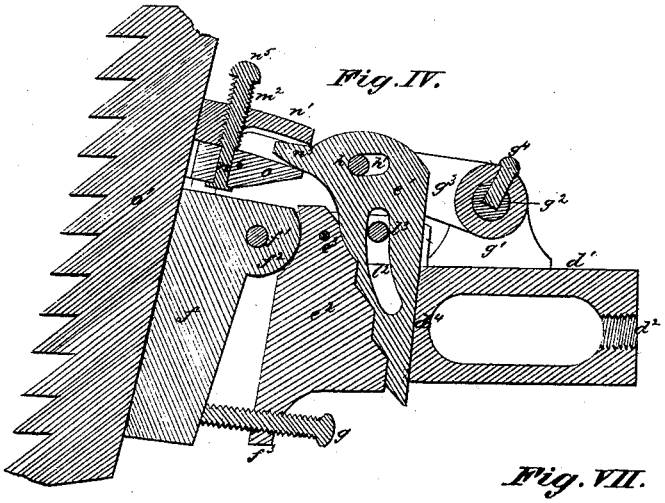


Fig. VII.

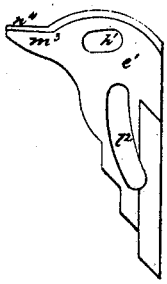


Fig. V.

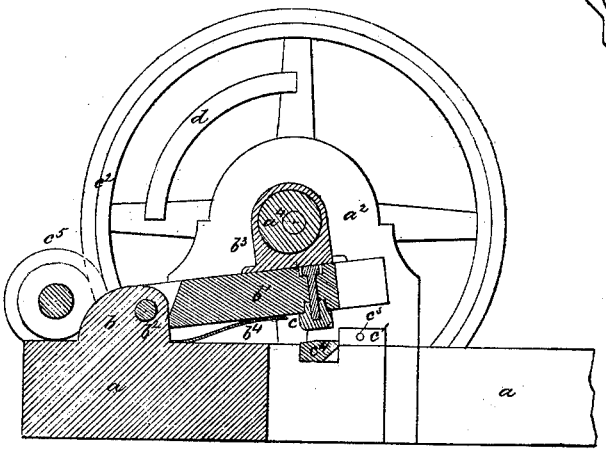
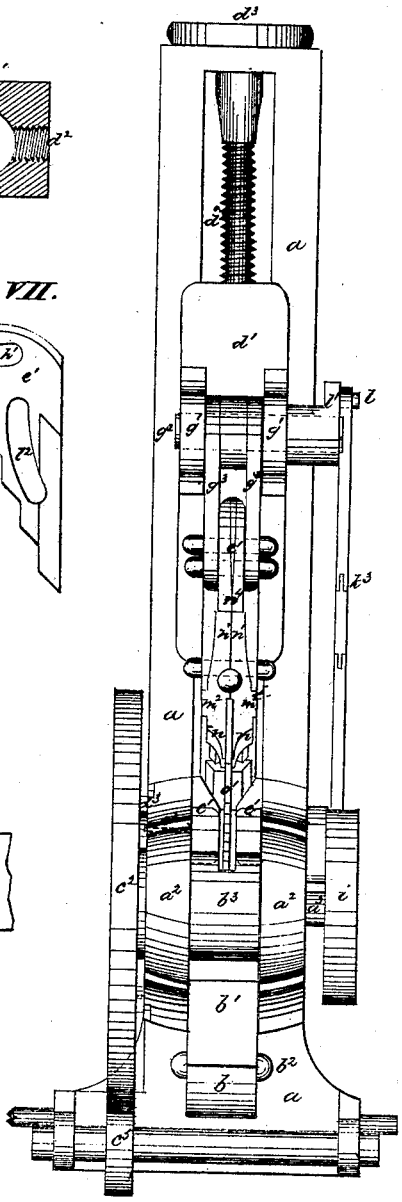


Fig. II.



INVENTOR.

John Lough

WITNESSES

Wm Ritchie

Robert H. Knight

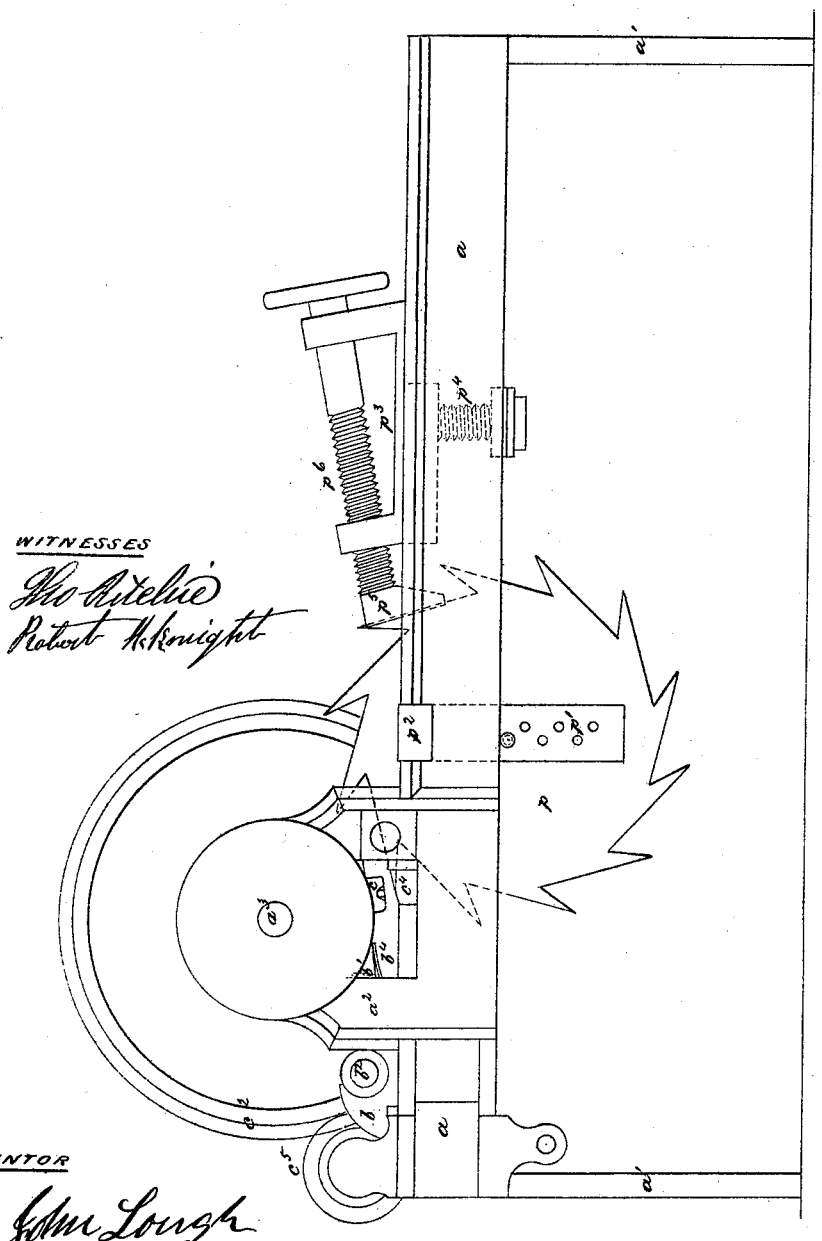
J. Lough,

3 Sheets, Sheet 3.

Saw Swage.

No. 111,953. Patented Feb. 21. 1871.

Fig. III.



WITNESSES

Thos Artelie

Robert H. Knight

INVENTOR

John Lough

United States Patent Office.

JOHN LOUGH, OF BUCKINGHAM, CANADA.

Letters Patent No. 111,953, dated February 21, 1871.

IMPROVEMENT IN SAW-TOOTH SWAGES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOHN LOUGH, of the village of Buckingham, in the county of Ottawa, in the Province of Quebec, in the Dominion of Canada, millwright, have invented new and useful Improvements on Self-acting Saw-Tooth Press; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, where—

Figure I represents a side elevation of the press.

Figure II, a plan.

Figure III, a side elevation of the press arranged for circular saws.

Figure IV, a detail of the press.

Figure V, a detail of the press.

Figure VI, a detail of the press.

Figure VII, a detail of the press.

This invention relates to an improved machine for forming or dressing the teeth of saws by pressure adapted to be driven by power, and, when arranged for straight saws, it is self-acting or automatic.

It may here be well to remark that I have already obtained Letters Patent for the principle of forming or dressing the teeth of saws by pressure, together with a hand-machine or apparatus, &c., for performing the same. These form no part of the present application in so far as the apparatus is concerned.

In the drawings similar letters of reference indicate like parts.

Letter *a* is the bed of the machine, being in form very similar to the bed of a lathe, and elevated to any suitable height above the ground by supports a^1, of any required construction.

a^2 a^2 are two side pieces extending upward, attached to or made in one with the bed *a*.

In these, journal-boxes are formed to carry the cross-shaft a^3, formed with an eccentric, a^4, situated between the two side pieces a^2 a^2.

The bed *a* is formed with a projection, *b*, suitably provided to attach one end of the die-lever b^1 to it.

This lever is of the general form shown in the drawing, its end being attached to *b*, in the form of a double eye, with pivot-pin b^2.

A slide-block, b^3, having a hole bored in it to fit the eccentric a^4, is placed upon the eccentric. This is of sufficient depth to reach down and act upon the upper side of the lever b^1, provided with a smooth flat surface.

On the under side of this lever a spring, b^4, is situated for keeping the lever up against the block b^3.

On the under side of the lever, and provided with a suitably-formed neck, by which it can be turned round, is attached the die *c*, and any of its four sides presented for use.

The lever may be supplied with a variety of dies, each made with three recesses of various sizes and shapes to suit the various forms required to be given to the saw-teeth.

The fourth side may be made with a plain curved chamfer for the purpose of compressing the upper and lower edges of the teeth only.

In the bed *a*, and in a proper position beneath the die *c*, a recess is cut for holding the anvil c^4, mitered or dovetailed in any suitable manner to secure it in its position. On this anvil the lower side of the saw-tooth rests while being pressed.

Between the two side pieces a^2, and attached one on each, are two guides, c^1 c^1, arranged to guide the saw sidewise to the exact position under the die.

The front one may be adjusted by a set-screw, while the back one is operated by a suitable bar, c^3, as will be hereinafter more particularly described.

On the back end of the shaft a^3 a gear-wheel, c^4, is attached, actuated by a suitable pinion, c^5, for transmitting the power to give motion to the parts of the machine.

On the arms of this wheel, and of the required length, a suitable projection, *d*, is situate to act on the end of the bar c^3, causing it to press the guide c^1 to that side and hold the saw in the proper position laterally, being so timed, as regards the revolution of the wheel, that the action of c^1 c^1 shall commence to hold the saw a little in advance of, and continue a little after the die *c* has pressed the tooth of the saw, when it is released.

On the upper side of the bed *a*, as shown in the drawing, an adjustable rest, d^1, is placed, adjusted, and held in any required position, as regards distance from the anvil c^4, by a screw, d^2, actuated by a wheel, d^3, the rest d^1 having a slot extending a considerable part through it in a vertical longitudinal direction.

The end d^4 of this slot is inclined at a suitable angle to form a rest for the back of the wedge e^1, it being of the notched form shown in Fig. IV, and made to conform to another inverted notched wedge, e^2, attached, by a pin, e^3, to the slides e^4, sliding upon the top of the front part of the rest d^1.

To these slides e^4 a saw-back rest, *f*, is attached by pivot f^1. On this it freely partially rotates.

The projection f^2, in which this pivot is situated, corresponds to and bears in a suitably-formed concavity in e^2, for the purpose of preventing the strain caused by the pressure of the saw against it injuring the pivot f^1.

To hold the bottom end of the rest *f* in the proper position a projection, f^3, is formed at the bottom of e^2, provided with an adjusting-screw, *g*.

On the upper side of the rest d^1, and in the required position, two projections g^1 are formed, carrying the rock-shaft g^2.

On this, between the projections, a double arm, g^3,

is secured by a pin, g^4, the pivot h passing through both ends of the double arm, and also through a slotted hole, h^1, made in the top of the wedge e^1.

On the shaft a^2, and on the front end of it, is secured the disk i, having on its inner side (shown in detail, Fig. VI) a cam-formed groove, i^1, receiving in it the pin i^2 attached to the upper end of the lever i^3.

This lever is pivoted to the front side piece a^2 by pivot k^1, on which it is thus made to oscillate.

To the pin k^2, at its lower extremity, a connecting-rod, k^3, of the well-known double-jointed form, known as safety connecting-rods, which will resist an ordinary pressure; but if a jam of any of the parts of the machine takes place it will yield and double up at the joints.

The other end of this connecting-rod is attached to the pin l at the end of the arm l^1 secured on the front end of the rock-shaft g^2, and causing it to partially rotate. In doing this the arms g^3 lift the wedge e^1, its back being retained close against the bottom of the slot d^4 by projecting side pieces on it, sliding in corresponding grooves in the side, at the end of the slot.

In the wedge e^1 another slotted hole, l^2, of the configuration and situation shown in Figs. IV and VII, is formed, having a pin, l^3, passing through it and the slides e^4, causing the latter to move back, as the wedge e^1 rises, by arms g^3; consequently c^3 and f, being attached to the slide e^4, move back also.

The saw is attached to f, and its teeth, automatically and in succession, placed upon the anvil c^4 in the following manner:

To the bottom end of f spring-clasps m are attached, griping the saw sidewise with such force as to a little more than support its weight.

On the sides of f grooves are formed for the side pieces m^1 to slide in.

These are formed with a head, m^2, made in two parts, attached at their top, and having extensions n in front griping the saw, when the still longer extensions n^1 behind are pressed apart.

This is accomplished by forming the projection n^3 on e^1, with an inclined edge, n^4, acting as a wedge inserted in corresponding matrical inclines formed on the lower inner edge of h^1.

That the amount the saw may be lifted may be adjusted, a screw, n^5, is provided. Its bottom end may be made by screwing it down to rest on f and elevate the head m^2, so that, during the rise of e^1, it moves through part of its stroke without the head m^2 being acted upon.

That the head m^2 may be brought back, and not retain its position after being elevated by n^3 to the spindle-end n^6 of the screw n^5, a projection, o, is attached, coming under n^3, and as this descends o is pressed down with it.

The machine is so arranged that the action of its parts, hereinbefore described, will be so arranged that the teeth of the saw o^1 will be placed on the anvil in time to be acted upon by the die c.

When the apparatus is arranged for circular saws the rest d^1 is removed, together with all its attachments and appurtenances.

The circular saw p is placed between the two sides of the bed a, as shown in Fig. III, and supported in the desired position by two suitable hangers p^1, one on each side of the saw, having their upper ends p^2 made to slide upon the bed a.

A rest, p^3, is secured, at any required position, on the bed a by screw p^4; also provided with a block, p^5, actuated by a screw, p^6, in the manner indicated in the drawing, to hold the saw from backing out when the teeth are being treated.

In all other respects the machine is constructed the same as that hereinbefore described for straight saws.

Having described the construction of my invention, I will now explain its operation.

First, as applied to straight saws, and as arranged in Figs. I and II, the saw is introduced into the machine and the first tooth to be treated placed upon the anvil c^4.

The rest d is then put and secured in its proper position, so that, when the wedge e^1 is down in its place, the saw o^1 has its back fairly against the front grooved edge of f, it being adjusted by the screw g to the required angle.

The saw is then held and supported by the spring-clasps m.

The guides c^1 c^1 are next adjusted.

The die now descends and presses the tooth, after which the wedge e^1 is lifted in the manner above described, causing the projections n to clasp and hold the saw with such force that it overcomes the friction of the spring-clasps m and draws the saw upward a sufficient amount to bring the next tooth high enough, so that, when the wedge e^1 descends again to its place, the next tooth is placed upon the anvil and pressed, all the parts of the machine operating as hereinbefore described, and in this manner all the teeth are successively pressed.

Secondly, in the machine as arranged for circular saws, the operation is as follows:

The saw p being suspended by its center by the adjustable sliding hangers p^1, the position of which may be varied by sliding them upon the bed a, and the height of the saw by the holes, as shown in the hangers in Fig. III, or in any suitable manner, one of its teeth is placed upon the anvil c^4.

The guides c^1 c^1 are next adjusted.

The rest p^3 is then secured in the required position, with the block p^5 situated as shown in the drawing, to prevent the saw backing out when the die c^1 descends, pressing the tooth.

By revolving the screw p^6 the block p^5 is moved back a sufficient distance to allow the saw and hangers p^1 to slide back a sufficient amount for the saw to be turned round, and the next tooth laid upon the anvil and pressed in the same manner as the first. In like manner the remainder of the teeth are treated.

Having now described the construction and operation of my invention, to which I have given the name of "LOUGH'S Improved Self-acting Saw-Tooth Press," I beg to state that I disclaim all other forms of saw-tooth presses now in use.

What I claim as my invention, and wish secured by Letters Patent, is the new and useful "Improvements on Self-acting Saw-Tooth Press," as follows:

1. The combination of the griping and lifting devices n n^1 o n^5 n^3 g^3, with the holding devices m, as described.

2. The combination of griping and lifting devices with a holding device, and die, and anvil, as described.

3. The combination of an irregularly-formed wedge and rock-shaft with devices for griping, holding, and lifting the rod, as described.

Montreal, 1st day of November, A. D. 1870.

JOHN LOUGH.

Witnesses:

THO. RITCHIE,

ROBERT MCKNEIGHT.