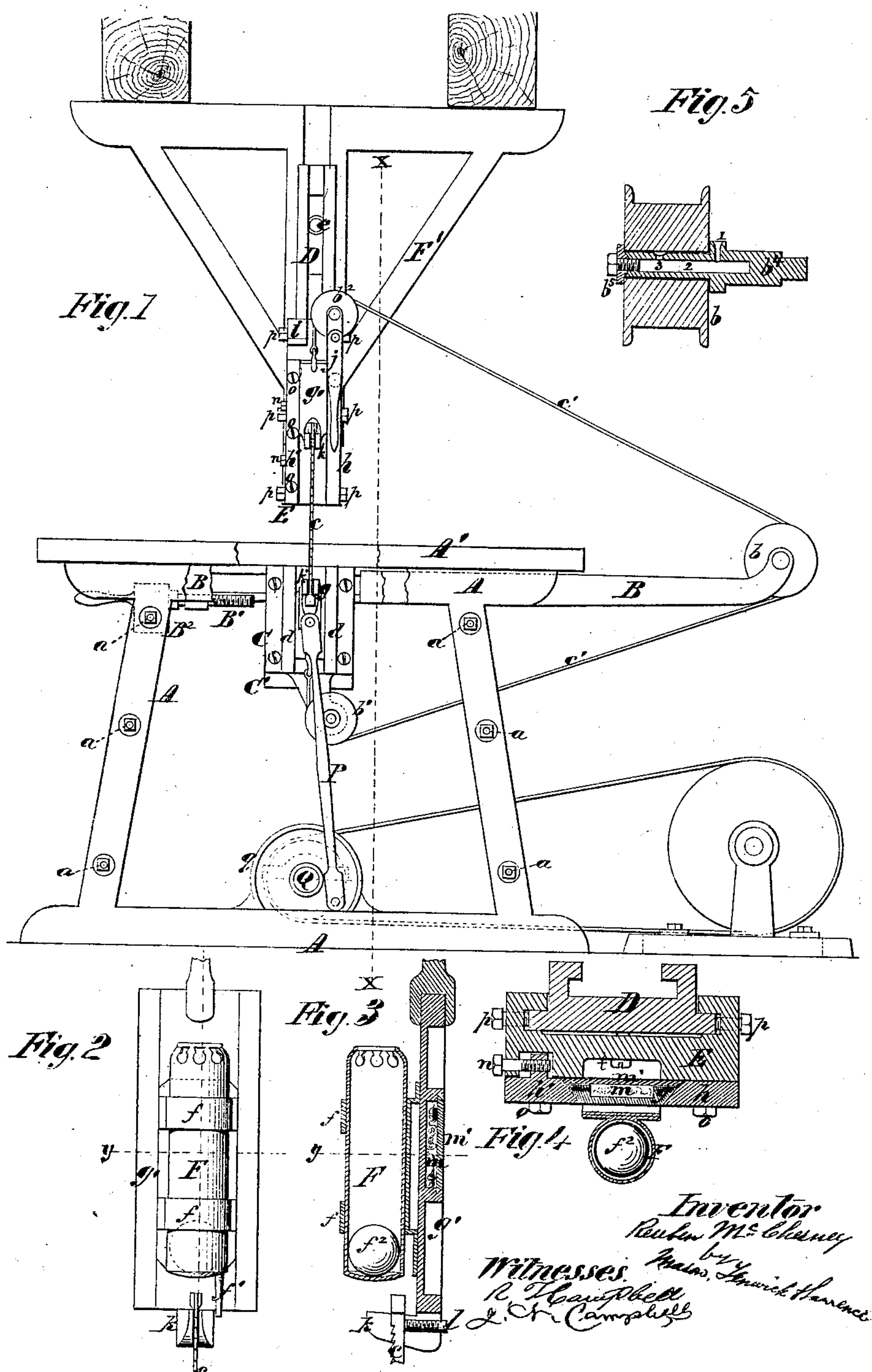
2 Sheets-Sheet 1.

R. McChesney,

Scroll Saw.

No. 101,897. Patented Apr. 12, 1870.



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2 Sheets. Sheet 2.

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Fig. 6

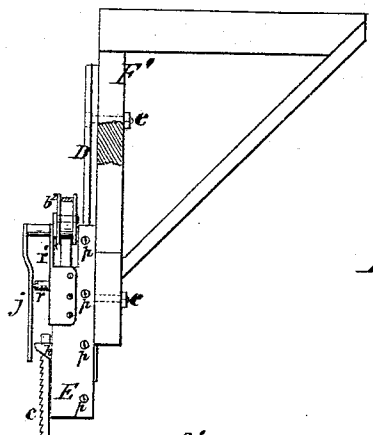


Fig. 8

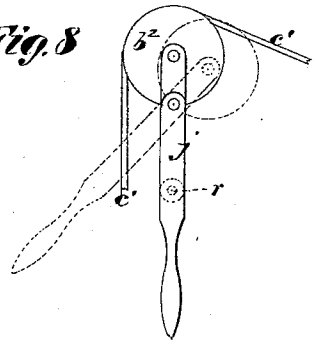


Fig. 9

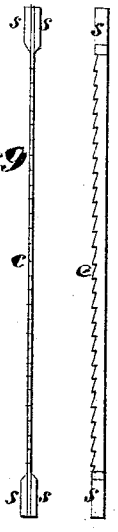
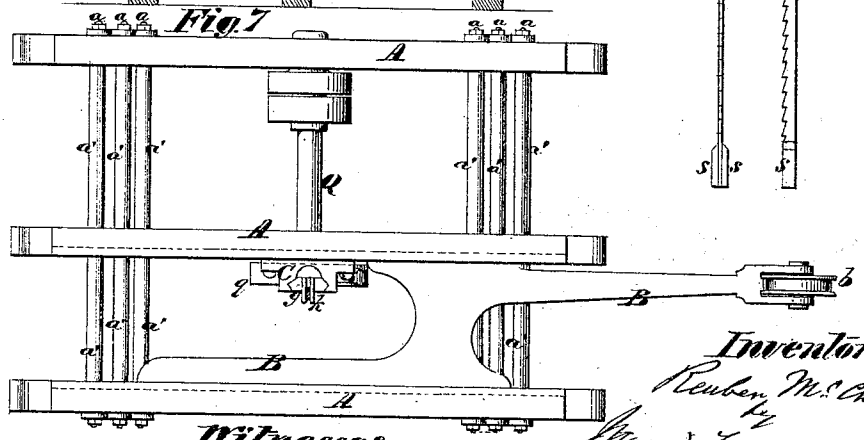


Fig. 7



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REUBEN McCHESNEY, OF BIRMINGHAM, CONNECTICUT.

Letters Patent No. 101,897, *dated April* 12, 1870.

IMPROVEMENT IN SCROLL-SAWS.

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, REUBEN McCHESNEY, of Birmingham, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements on Scroll-Saw Machinery; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1, plate 1, is a front elevation of the improved sawing-machine, with portions of the frame and table-top broken away, to expose the parts behind them.

Figure 2, plate 1, is a front view of the upper saw-head with my improved air-pump attached.

Figure 3, plate 1, is a section, taken centrally through the upper saw-head and its air-pump, in a vertical plane.

Figure 4, plate 1, is a section, taken through the upper saw-head and its guides, in the horizontal plane indicated by dotted lines *y y* in figs. 2 and 3.

Figure 5, plate 1, is an enlarged diametrical section through one of the saw-belt pulleys, showing the manner of lubricating the same.

Figure 6, plate 2, is a section, taken transversely through the sawing-machine, in the vertical plane indicated by dotted line *x x* in fig. 1.

Figure 7, plate 2, is a top view of the table-frame and its attachments.

Figure 8, plate 2, is a view of the upper adjustable saw-belt pulley and its adjusting lever.

Figure 9, plate 2, shows the improved saw.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to certain novel improvements on scroll or gig-sawing machinery, and consists—

First, in a horizontally and vertically adjustable guide for the upper receprocating saw-head, whereby the guide can be adjusted in a true vertical position with respect to the lower saw-guide, and also adjusted vertically for adapting the machine to receive saws of different lengths, and to work stuff of different thicknesses, as will be hereinafter explained.

Second, in applying one of the pulleys, over which passes the belt or flexible saw connection, to an adjustable bearing, which will allow a saw to be quickly slackened when it is desired to remove it from its heads or holders, as will be hereinafter explained.

Third, in applying above the upper saw-carrying head an elastic cushion, which is so arranged that should a saw break while the machine is in operation, this cushion will receive the blow caused by the sudden ascent of the upper saw-head, and thereby prevent this head from striking the upper pulley of the flexible saw connection, as will be hereinafter explained.

Fourth, in applying to the slotted foot-piece of the upper saw-head an adjusting-screw, in such manner that when a saw is in its place between the upper and lower heads, this screw will afford a back bearing for the upper end of the saw, and admit of readily adjusting the saw to any required rake or degree of pitch, as will be hereinafter explained.

Fifth, in a novel air-pump, having a gravitating piston, and applied to the upper saw-head for the purpose of blowing currents of air upon the work, and enabling the sawyer to see his lines, and guide the work accordingly.

Sixth, in constructing the frame of the table, upon which the work lies while being guided to the saw, of vertical sections, united by tubular braces and through-tie rods, whereby a very substantial frame is obtained, which can be taken to pieces and packed in a very small compass for transportation, as will be hereinafter explained.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings—

A A A represent three vertical sections, which are secured together at suitable distances apart, and constitute a frame for supporting the horizontal table top A, upon which the work lies while being sawed.

For the purpose of rigidly securing the sections A together I employ tubes *a'*, having tenons formed on their ends, which tenons are fitted in recesses made into the said sections; and for the purpose of drawing together and holding the sections against outward thrust, bolts *a* are passed horizontally through the sections and the tubes, as shown in fig. 6, and secured by means of nuts on their extremities.

A frame constructed and put together in this way will be very rigid and substantial, and when necessary to pack it for transportation, it can be conveniently taken down and stowed away in a very small space.

The vertical sections A will be made of metal or wood, the former being preferable.

From the middle of the length of the intermediate frame section A, and depending from the top horizontal portion of this section, is a piece, C', to which is rigidly secured a guide-block, C, having vertical jaws *d d* upon its front face, between which the lower saw-head *g* is fitted to slide up and down.

The head *g*, which is constructed with a forked holder, *k'*, for the lower end of the saw *c*, receives vertical motion from a wheel, *q*, on shaft Q, through the medium of a pitman, P, which may be provided with a turn-buckle, for extending or contracting it.

The wrist-pin, on the face of wheel *q*, may also be made adjustable toward or from the axis of this wheel, for shortening or lengthening the stroke of the saw.

Motion may be transmitted to shaft Q by means of a belt, or in any other convenient manner.

From the joists or ceiling of the building of the apartment in which the machine is arranged, and directly over the table top A′, depends a braced support, F′, which is rigidly secured to the joists in proper position with respect to the lower guide-block C′, to afford a support and means of attachment for the upper guide E, as shown in figs. 1 and 6.

To the central vertical portion of the braced pendant F′, a vertical guide, D, is secured, by means of bolts *e e*, which pass through oblong slots made through the guide D, and receive binding nuts upon them, back of the pendant, as shown in fig. 6.

By loosening the nuts on bolts *e e*, the guide D can be adjusted vertically.

The guide D has feathers on its vertical edges which receive jaws which are formed on the guide-block E, which latter is secured to the guide D, by means of set-screws *t*, (see fig. 4,) and adjusting set-screws *p p*.

The ends of screws *p p* abut against the feathers on the guide D, and are used for adjusting the guide-block E laterally, for setting and keeping it in a true vertical position.

The screws *t* are used for allowing the guide-block E to be adjusted vertically on the guide D, for accommodating this block to different thicknesses of stuff it is desired to saw.

The guide-block is provided with two jaws, *h h′*, one of which is fixed permanently, and the other, *h′*, is adjustable, to compensate for wear.

Between these jaws *h h′*, the upper saw-jaw head *g′* is fitted to move up and down, and when this head works loose, as it will do when the machine is used for a considerable length of time, the screws *n*, (see fig. 4,) are turned so as to set the jaw *h′* up snugly against the head.

Two ends of the heads *g g′* are connected together by the saw *c*, and the two opposite ends of these heads are connected by a strap, *c′*, which may be of metal, leather, or other suitable material.

This flexible connection is fastened by its upper end to a loop, rising centrally from the upper end of the saw-head *g′*, and carried upward, and passed over a grooved pulley, b^2, thence off to one side of the machine, and around a grooved pulley, *b*, thence downward beneath a grooved pulley, b^1, and upward to a loop on the bottom of the lower saw-head *g*, to which loop the strap is attached, as shown in fig. 1.

Thus it will be seen that the saw *c* and flexible connection *c′*, with the heads *g g′*, form a continuous or endless belt, which will receive a reciprocating motion from the wheel *q*, through the pitman P, acting on the lower saw-head *g*.

The lower pulley b^1 has its axis or stud fixed to a pendant, which is rigidly secured to the lower end of the guide-block C.

The pulley *b* has its bearings upon the outer extended arm of a horizontally-adjustable beam, B, and the pulley b^2 has its bearings on the short arm of a hand-lever, *j*, which lever is pivoted to a bracket, *r′*, secured to the upper portion of the guide-block E.

The beam B has tenons formed on its parallel edges, which are fitted to slide in grooves formed in the upper horizontal portions of two of the frame sections A A, and this beam is cut away, as shown in fig. 7, so as not to interfere with the lower saw-guide and the saw.

By means of a screw, B^1, which is tapped through a fixed block, B^2, the beam B can be adjusted in a direction with its length, and the flexible connection *c′* and saw *c* tightened or loosened as may be required.

By this means the saw can be tightened while running.

The lever *j*, carrying pulley b^2, has an indentation made into its longest arm, which is received by a fixed conical stud, *r*, on bracket *r′*, when the lever *j* is in the vertical position, shown in full lines, figs. 1 and 8, and thus held firmly.

By springing the lever *j* outward, so as to free it from its stud *r*, and swinging this lever to one side, as indicated in fig. 8, in dotted lines, the strap *c′* will be slackened, and the saw *c* can be removed from its heads *g g′*.

Instead of applying the pulley b^2 to a lever, as described, it may be applied to a vertically-adjustable bearing, acted upon by a cam or its equivalent.

The pulley b^2 is arranged above the upper saw-head *g′*, and in order to prevent this head from being thrown up and striking this pulley, should a saw break while in motion, a cushion, *i*, of rubber or other material, is affixed to the guide-block E, in such position as to receive the blow of the saw-head should an accident occur to the same.

Hitherto gig-saws have been secured to their reciprocating heads either by clamping devices or by making holes through the saw-blades, and securing studs therein, which studs allowed the saws to be strained between forked holders.

The clamping devices are liable to many objections, and the applying of studs through holes made through the ends of the saw-blades, weakens the saws at those points, and renders them very liable to break.

To obviate these objections, I solder or braze on each side of each end of the saw *c* a piece, *s*, of metal of suitable thickness, and of a width equal, or nearly so, to the width of the saw-blade, as shown in fig. 9.

In this way I form enlargements on the ends of a saw for allowing it to be strained between the forks *k k′*, and I strengthen the saw so that it will not be liable to break at those points.

As an equivalent of this plan of enlarging the ends of a saw-blade, the ends of a blade may be heated and bent around a pin, so as to form rounded enlargements.

I shall now refer particularly to figs. 2, 3, and 4.

To the face of the upper saw-head *g′* I secure, by means of straps *f f*, or in any other suitable manner, a cylinder, F, which is open at its upper end, and closed at its lower end, except a small orifice into which a tube, f^1, is fixed, as shown in fig. 2.

Within the cylinder F a ball or cylindrical plug, f^2, is put, so as to play freely up and down, which ball or plug may have a valve opening downward adapted to it.

The cylinder F is the body of a pump, and the ball or plug f^2 the piston thereof, and when the saw is running, the rapid vertical motions given to head *g′* will cause the piston f^2 to play up and down, and force currents of air through tube f^1 upon the work for blowing away the saw-dust.

I prefer to make the body F cylindrical, but it may be made prismatic.

In the back of the saw-head *g′* a chamber, *m*, is formed, which is filled with cotton-waste, or other suitable porous substance, saturated with oil, and closed by a sliding cover, *m′*, fitted in a dovetail groove made into the back of the saw-head, as shown in figs. 3 and 4.

A sufficient quantity of oil will escape from the chamber *m* to keep the saw-head well lubricated.

In fig. 3 I have shown an adjusting-screw, *l*, ap-

plied to the forked holder *k*, and tapped into the latter from behind, so as to afford a back-rest for the saw near its upper end.

This screw being adjustable, serves as a very convenient means for giving the desired forward rake or pitch to the saw.

In fig. 5, I have shown an enlarged section of one of the pulleys, over which the flexible saw-connection *c'* passes, and the short shaft b^4 of this pulley.

It will be seen that the shaft b^4 is hollow, and that by supplying the chamber 2 with oil, through the inlent 1, the oil will escape through outlet 3, and lubricate the parts.

The conical washer b^5 being tightly screwed into its seat in one end of shaft b^4, will prevent the escape of the oil from the chamber 2.

In referring to the tubular braces *a'*, I described them as having tenons formed on their ends, which entered mortises made into the frame A. Instead of the tenons, dowel-pins may be formed on the ends of said braces *a'*, and perforated metal plates inserted into the frame A, for receiving said dowel-pins.

Having described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The horizontal and vertical guide E, applied to a vertically-adjustable guide, D, substantially in the manner and for the purposes described.

2. The pulley b^2, of the saw-connection *c'*, applied to an adjustable bearing, *j*, or its equivalent, substantially as and for the purposes described.

3. The cushion *i*, arranged above the saw-carrying head *g'*, substantially as and for the purposes described.

4. The device *l*, for adjusting the saw for different rakes, applied to holder *k*, so as to serve as a back-bearing, substantially as described.

5. An air-pump, which is constructed and applied to a sawing-machine, substantially as described.

6. The saw-frame A, made of rigid sections, connected together by tubes *a'*, tenoned into the frame, and by tie-rods passed through said tubes, substantially as described.

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C. E. CLARK.