2 Sheets—Sheet 1.

W. C. MARGEDANT.

SCROLL SAWING-MACHINE.

No. 170,578. Patented Nov. 30, 1875.

Fig. 1.

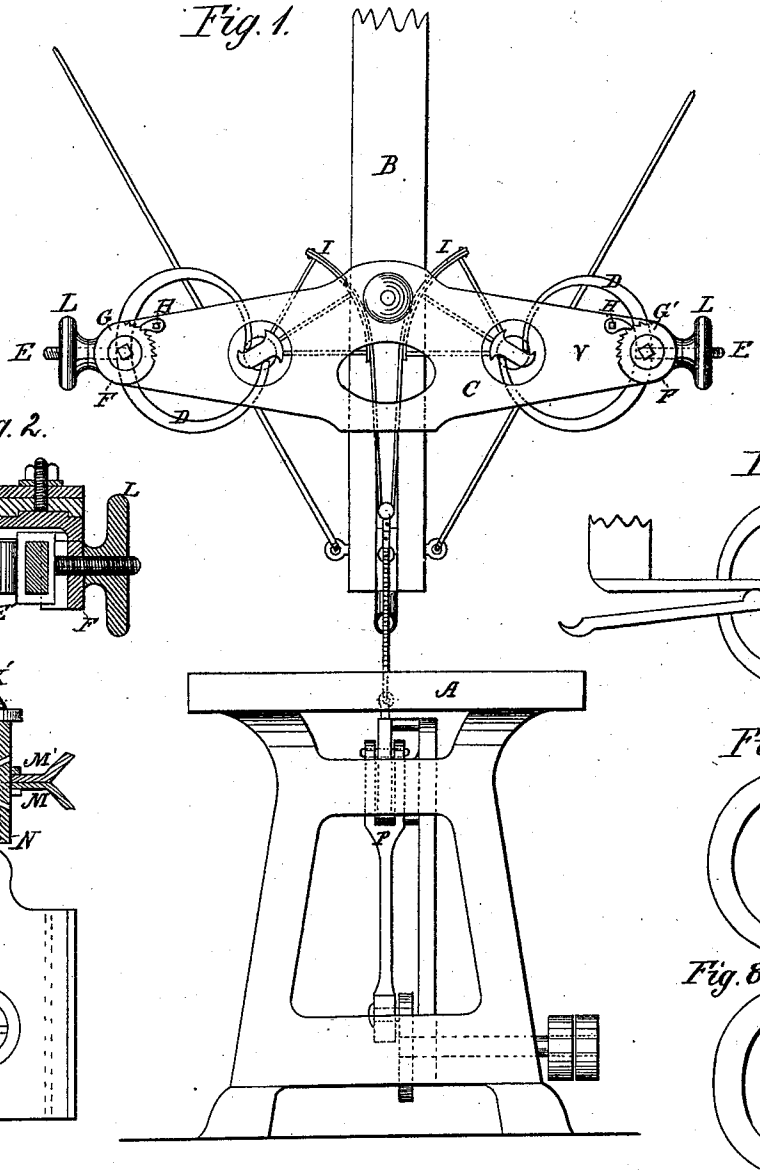


Fig. 2.

Fig. 7

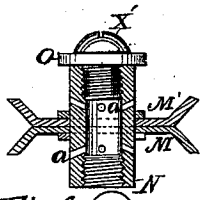


Fig. 6

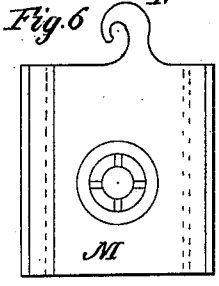


Fig. 10

Fig. 9

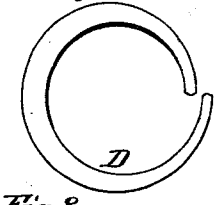
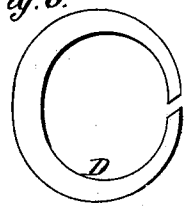


Fig. 8.



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2 Sheets—Sheet 2.

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SCROLL SAWING-MACHINE.

No. 170,578. Patented Nov. 30, 1875.

Fig. 3.

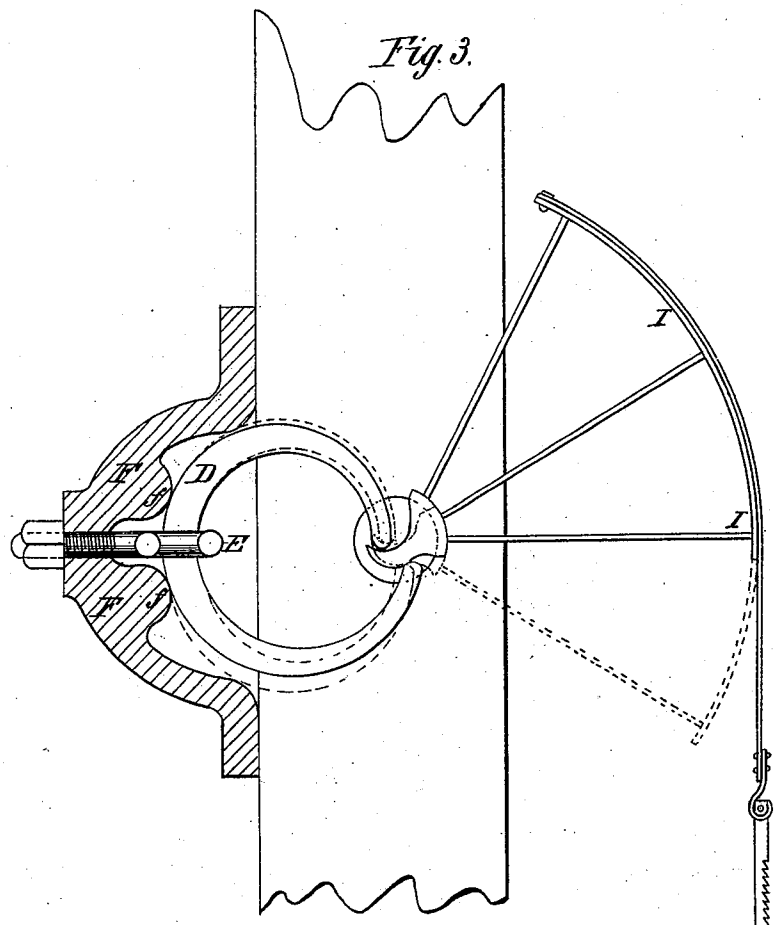


Fig. 4

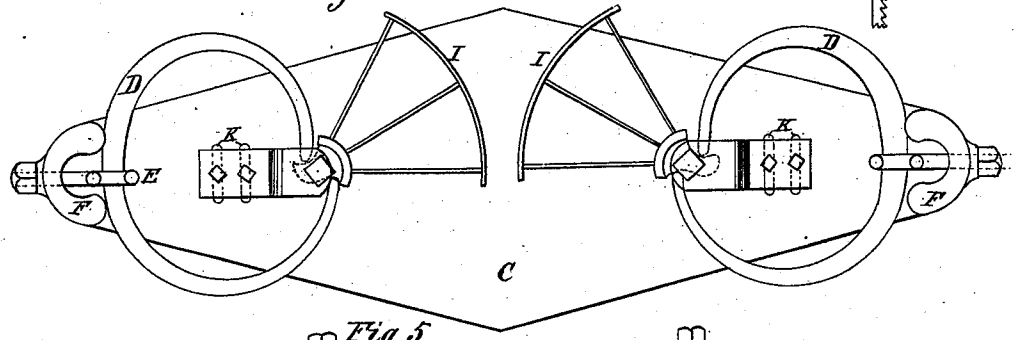
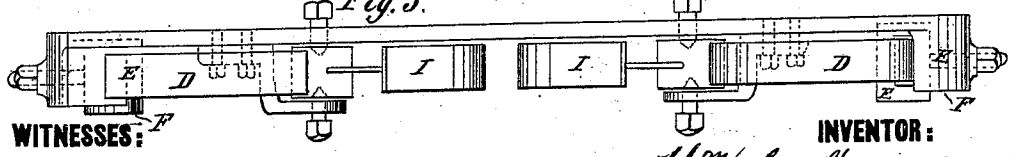


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM C. MARGEDANT, OF HAMILTON, OHIO, ASSIGNOR TO BENTEL, MARGEDANT & CO., OF SAME PLACE.

IMPROVEMENT IN SCROLL-SAWING MACHINES.

Specification forming part of Letters Patent No. **170,578**, dated November 30, 1875; application filed July 28, 1875.

To all whom it may concern:

Be it known that I, WILLIAM C. MARGEDANT, of Hamilton, in the county of Butler and State of Ohio, have invented a new and useful Improvement in Scroll-Sawing Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings forming part of this specification, in which—

Figure 1 is a front elevation of the jig-saw stand and the straining apparatus with double springs. Fig. 2, a sectional view through the line *v v*. Fig. 3 shows the straining device consisting only of one spring attached to a stanchion illustrating the different positions of the ends of the springs at the extremities of the movement of the saw-blade. Fig. 4 is an elevation of the straining device, the fulcrum of the radii moving on adjustable centers; Fig. 5, a top view of Fig. 4; Fig. 6, an elevation of the cross-head; Fig. 7, a top view of the cross-head. Figs. 8 and 9 are modifications of the spring; Fig. 10, a modification of the spring as adapted to be used with two acting levers.

My invention relates to that class of scroll-saws wherein a serrated linear blade is given a vertically-reciprocating motion by means of a crank, pitman, and cross-head, and where the blade is held at a uniform tension or strain at all attitudes of the saw-blade.

My improvement refers particularly to the apparatus or device which imparts to the serrated blade a certain amount of strain necessary to support the blade in its rapid reciprocating motion.

Experience has established the fact that most of the devices now in use for straining the blade are lacking those qualities which are necessary to obtain the required result, viz., a uniform strain at any point of the motion, a quick and sensitive action, and the adjustability and simplicity of wearing parts.

In the drawings, A is the main stand or table, cast in one piece, provided with the usual driving-pulley, crank-wheel, pitman, cross-head M, and saw-holder. B is the stanchion or hanging standard, suitably attached to the ceiling, and supporting the adjustable plate C, which carries the adjustable springs D and D′. The latter are held by the straining-loops E E′. (Shown in Figs. 2, 4, and 5.) The straining-loops E E′ pass through the spring-saddles F F′. The spring-saddles are provided with toothed collars G G′, and pass through the adjustable plate C, and are fastened by means of a screw-nut. The toothed collars G G′ are in contact with the ratchet-pawls H H′. The ends of the springs D and D′ hold and press the radii levers I I′, which are connected with the saw-blade by leather strips or wire rope. The adjustable springs D D′ are formed of a bar of steel, which tapers off toward the ends.

It is not essential that they should be tapered at all, or tapered toward one or both ends. In some cases better results are obtained by making one end of the spring, which acts as the fulcrum of the radii or lever I, heavier than the other end. The principle feature is the bending of the bar in a circular, oval, or other suitable form or shape, so that the ends of the bar meet, as shown in Fig. 8; or that they pass in close proximity, as shown in Fig. 9.

If only one lever is acting on both ends of one spring, the points of contact or pressure should not meet in the same line, as the pressure on one side of the lever would be counterbalanced by the pressure on the opposite side.

If two levers are applied to one spring, as shown in Fig. 10, the ends of the spring may meet in one common line. I prefer, now, the application of one lever for obtaining a reciprocating motion, because the number of parts and friction is reduced.

Between the bearing ends of the bent spring should be a certain distance established to obtain leverage or mechanical advantages. The dimension of the distance must be made in conformity with the amount of pressure required, strength and size of the spring, length of the lever, and the length and acuteness of its action wanted.

Most of the springs which have been so far used for reciprocating machines are irregular and multiplying in force. By the use of cone and eccentric pulleys, and other devices, this

defect of springs has been partly remedied, but another defect established—that of complication of parts and connection, and consequently a loss of direct motion, increase in weight, and friction.

The construction of my improved spring, the attachment and operation of the lever, as well as the adjustability of the same, gives an equal strain at the whole length of motion, and consists of very few parts.

Fig. 3 shows a single spring in rest, and the position of the radii lever and spring when in action.

It will be noticed that the spring opens when the lever is depressed; but the distance between the ends of the spring, and consequently the leverage, and the leverage action between the same, are also diminished. By depressing the lever more, the points of pressure meet in one common line.

I prefer to arrange the spring and lever in such a manner as shown in Figs. 1, 2, and 3, if only light and quick sawing is required. For heavy work I believe the arrangement shown in Figs. 4 and 5 gives a better result. The difference in the latter device from the former consists in the use of an adjustable fulcrum on which the lever swings.

It will be observed that in Figs. 1 and 3 the lower end of the spring D is the fulcrum of the lever I; but it is not a fixed or stationary fulcrum. Its action is similar to the upper part of the spring.

Figs. 4 and 5 show the levers I I′ held by two pointed set-screws, which establish the fulcrum of the lever movement.

The springs may be adjusted to press more on the upper or lower side of the levers, as the nature of the work may require.

The plate C can be provided with slots K, so as to adjust the springs, including center-screws.

The strain or pressure of the saw may be increased or reduced by the hand-wheel L.

Fig. 3 shows the arrangement on a large scale. The spring D rests on the spring-saddle F on two higher points, *f f′*, which said points or projections cause the two ends of the spring D to be pressed together and stiffened when the straining-loop E is tightened, so that the said spring may be adjusted as to its tension. By loosening a fastening on the strain-loops E E′, the two ends of the spring will impart less pressure to the lever I.

The whole plate C can be raised or lowered for accommodation of long or short saws, or for more or less strain.

The spring-saddle F F′, with springs and hand wheel, may be turned up on their axle or down, and the ratchet-pawl inserted at different places of the ratchet-wheel for an increase or decrease of strain.

Figs. 6 and 7 illustrate the construction of the cross-head M. As that part of the machine should combine great strength and lightness, I prefer to make it of two steel plates, M M′. A piece of suitable plate-steel is cut out in proper form. That part which will form the slides is bent at the desired angle. The two plates are lightly riveted together and brazed. A hollow solid cylinder, N, is inserted in the middle of the plate, which forms the journal-pin for the pitman. If a solid cylinder is used, it is bored out, and in both cases a screw-thread is cut in the inside of the cylinder. The wooden pitman is held to the journal-pin by means of washers O, which are held by small screws inserted partly in the hollow pitman-pin. As the screws X′, which hold the washers O and pitman P, do not meet, an empty space is formed in the pitman-pin, which I fill with plumbago, or other suitable lubricator. By boring several small holes, *a*, from the outside of the pitman-pin to the lubricating-chamber, the contents will be thrown by the reciprocating force to the bearing parts of the pitman and pin.

By cutting superfluous metal away, a web-slide is produced with a hollow pin which is very light and strong, and which carries in itself a lubricator which lubricates automatically the working parts when the saw is in motion and lubrication is needed. The crank-pin, connecting the pitman with the crank-wheel, is also hollow, and provided with channels for lubrication.

The application of spring or springs, as specified, as well as that of a lubricating-pin on other machines, I shall preserve.

Having thus described my invention, what I claim as new is—

1. In a scroll-saw, a straining or spring device consisting of a bar of steel or other suitable material, bent in such a form that both ends of the spring are in close proximity, in combination with a lever of suitable form inserted between the ends of the spring, as described, so that the action of the spring is transmitted to the lever, and transformed thereby into a reciprocating motion, substantially as described.

2. In a scroll-saw, a spring formed of a bar of steel or suitable material, bent as described, so that the ends of the bar come in close proximity, in combination with a lever which swivels on an independent fulcrum, while one end of the spring is active in front, and the other end of the spring is active on the opposite side of the fulcrum of the lever, substantially as described.

3. The slides formed of plates M M′, in combination with the hollow pitman-pin, having holes *a*, the washers O, and screws X′, as arranged, and for the purpose specified.

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Witnesses:

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