F. D. GREEN.

CIRCULAR SAWING-MACHINES.

No. 194,237. Patented Aug. 14, 1877.

Fig: 1.

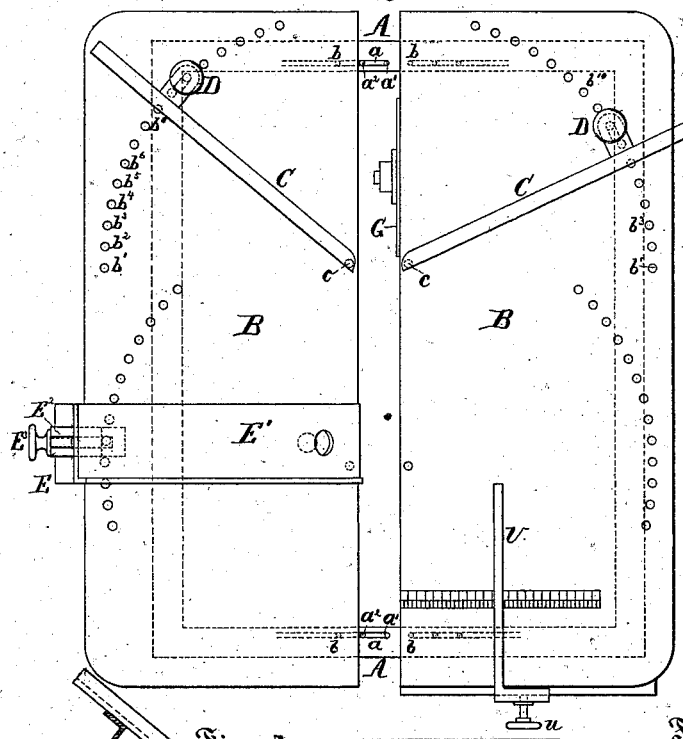

Fig: 2.

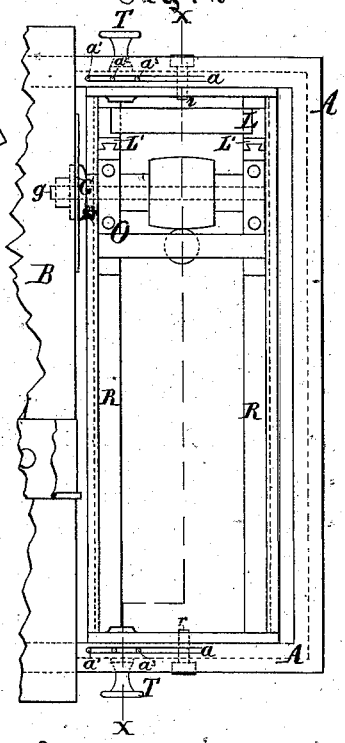

Fig: 4.

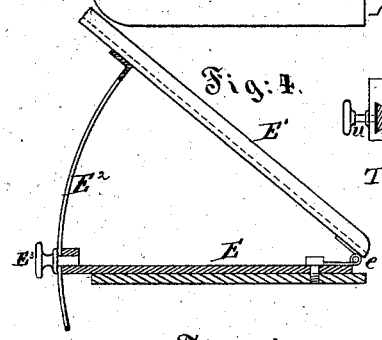

Fig: 3.

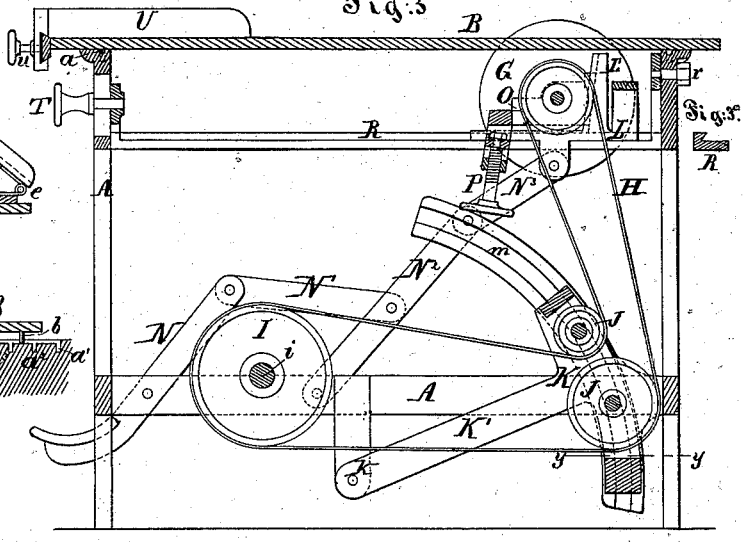

Fig: 5.

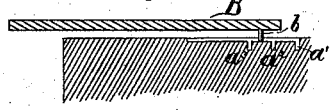

Fig: 6.

Witnesses:

Chas. C. Stetson

A. Hayes Gentner

Inventor:

F. D. Green

by his attorney

J. L. Stetson

UNITED STATES PATENT OFFICE.

FRANCIS D. GREEN, OF WILLIAMSPORT, PENNSYLVANIA.

IMPROVEMENT IN CIRCULAR SAWING MACHINES.

Specification forming part of Letters Patent No. **194,237**, dated August 14, 1877; application filed March 10, 1877.

To all whom it may concern:

Be it known that I, F. D. GREEN, of Williamsport, Lycoming county, in the State of Pennsylvania, have invented certain Improvements relating to Sawing-Machines, of which the following is a specification:

This is of the same class of machinery as is described in my patents of October, 1872, June, 1873, and April, 1876. I have increased the capacity of the machine for executing several kinds of work.

I employ two pivoted gage-bars, each capable of being adjusted around a pivot at its inner end, and provided with a slotted lug, by which it is secured at the desired angle with the plane of the saw by means of a thumb-screw inserted in any of a series of holes. There are two sets of scales and two of the series of holes on each side. The gage-bars can both be set on one side, or they may be set one on each side of the saw. For general sawing of miters or other angles the gage-bars are set at the back end of the table; but for cutting off, and for sawing a number of pieces at one time, the gage-bars are moved to the front of the table. In that position the saw presses the pieces to be cut against the gage-bars.

I employ a dado and bevel-gage, secured removably to the top of the table, capable of being adjusted vertically to any angle up to forty-five degrees. This is used for cutting the lower end of window-frames and analogous beveled work. It can be lowered parallel to the table, and used for dadoing or rabbeting at right angles.

When the machine is to be used for slitting, the gage-bars and dado attachment are removed and a slitting-gage applied. This gage is adjustable on a dovetail on the front edge or end, and can be adjusted at pleasure.

The saw-mandrel is mounted in boxes in what I term a "saddle," which is adjustable vertically in its carriage to any height required. This is particularly important in dadoing.

The carriage for the saw runs in ways which are formed in one piece, and capable of rocking on centers, and of being thus adjusted at various angles. I term these "rocking ways." They form a dovetail and hold the carriage firmly, while allowing it free motion lengthwise. The dovetailing or engagement of the carriage to the ways prevents the cut of the saw from raising it. The parts can be adjusted so as to take up lost motion. The rocking ways can be firmly held at the desired angle by a pinching-screw at each end. For ordinary work the rocking ways are adjusted level, so that the saw cuts at right angles to the plane of the table.

When the rocking ways are inclined, and the saw consequently caused to cut at an angle, the belts are kept to the proper tension and in their proper position by means of two tightener-pulleys, supported in a frame running in curved guides. The frame is furthermore pivoted to a corresponding center.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the invention.

Figure 1 is a plan view, showing the several parts in position for use. Fig. 2 is plan view of one lug with top piece or table removed. Fig. 3 is a longitudinal section on the line $x\,x$, Fig. 2. Fig. 3^a is a transverse section through a portion of the carriage-way. Fig. 4 is a transverse section through one of the top pieces, showing the bevel-gage in elevation. Fig. 5 is a transverse section in the plane of the dowels and grooves. It shows the top piece or table in the act of being changed in position. Fig. 6 is a horizontal section through a portion on the line $y\,y$ in Fig. 3.

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

A is the fixed frame-work; a, the grooves in the top thereof; and a^1, a^2, &c., the holes.

B B are the two parts of the movable top or table, and b are the dowel-pins, which engage in either of the holes a^1, a^2, &c., at will. In adjusting the table from one position to another it is only necessary to lift the parts sufficiently to disengage the dowels from the holes in which they have been previously held, and then to move the table along, guided by the grooves a, until the dowels drop into the desired holes in the new position.

C C are gage-bars, turning on centers c, and adjustable by thumb-screws D, inserted into the proper holes b^1, b^2, &c. The slot in the

lug on each gage-bar should be sufficiently long to allow it a considerable range of adjustment before the thumb-screw requires to be shifted into another hole.

There are two of the curved sets or series of holes b^1 b^2, and two pivot-holes for the gages C *c*, on each half of the table.

E is the bottom, and E^1 the adjustable top part, of a removable frame for bevel work and dadoing. The top part E^1 is hinged to the lower part E at *e*, and is formed with a long curved lug, E^2, which receives a pinching-screw, E^3, tapped into a lug on the part E. Holes are made in the upper part E^1, to allow the screws to be operated which hold the lower part E to the table. The front edge of the upper part E^1 has a guide-lip.

In dadoing square the upper part E^1 should be lowered exactly level; but in dadoing bevel, as in the bottoms of window-frames to shed water, the curved lug E^2 allows any desired inclination to be assumed.

An entirely independent mode of cutting bevel is made available by inclining the saw.

G is the saw, and *g* the saw-mandrel. It is driven by a belt, H, running around a pulley, I, on the main driving-shaft *i*, which is driven by a steam-engine or other power. (Not represented.) There are two tightener-pulleys, J J, mounted in a single frame, K, so that they rise and fall together. This frame K has arms K′, which are pivoted to the main framing A at the points *k*. It is sufficiently heavy to maintain always the proper tension on the belts in all conditions, rising and falling as the saw-carriage is moved forward and backward. The frame K is guided laterally by efficient curved portions of the frame-work A, having curved grooves *m*, which receive projections *k′* from the sides of the tightener-frame K.

The saw-carriage L is drawn forward at will, by the action of the attendant, through the treadle-lever N, link N^1, second lever N^2, and link N^3, the latter being pivoted to the cradle near the saw. The carriage is formed with upright arms L′, having dovetail-grooves in their front faces, which receive corresponding parts of an adjustable saddle, O, which is shifted up and down in the carriage at will by means of the screw P. The saw-mandrel is, by this means, set up and down at will to compensate for wear, or to cause it to cut higher or lower in dadoing.

The carriage L travels in ways R R, with which it is engaged by dovetailing, as indicated in Fig. 3, and by dotted lines in Fig. 2, so as to resist the lifting action of the saw, and to be firmly and truly guided. The ways are connected at each end, and pivoted to the main frame at the points *r r*, forming a system of rocking ways capable of being held in various angular positions by means of the binding-screws T. By inclining these rocking ways the saw may be operated at various angles, or may be made to cut in corresponding planes. For ordinary work it is adjusted level.

For slitting, I employ a gage-bar, U, adjustable, or a dovetail rail in the front edge. It is held firmly in the desired position by a pinching-screw, *u*.

Many of the details may be modified within wide limits by any good mechanic.

I claim as my invention—

1. The saddle O and adjusting means P, in combination with the carriage L, adapted therefor, and with a circular saw and suitable driving means, adjustable up and down therein, as herein specified.

2. The rocking ways R R, turning on pivots *r r*, in combination with the carriage L, dovetailed or locked to the said ways, and with the saw G mounted thereon, as and for the purpose specified.

3. The curved guides *m*, in combination with the frame K, pulleys J J, carriage L, and saw G, as herein specified.

In testimony whereof I have hereunto set my hand this 3d day of March, 1877, in the presence of two subscribing witnesses.

FRANCIS D. GREEN.

Witnesses:

H. F. SNYDER,

N. D. CRAIN.