2 Sheets. Sheet. 1.

E. Miall. Jr,

Saw.

No. 92,080. Patented June 29. 1869

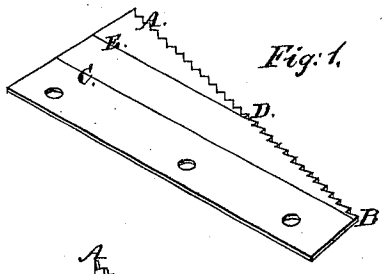


Fig: 1.

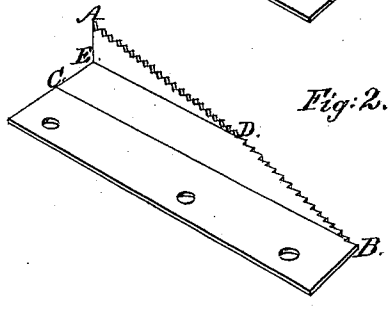


Fig: 2.

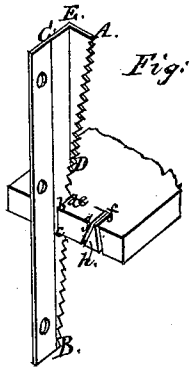
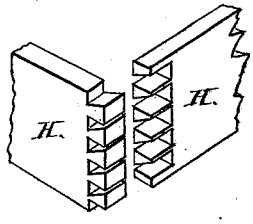


Fig: 3.

Fig: 4.



Witnesses,
H. N. Doubleday
Alex Mahon.

Edward Miall Jr.
Inventor,
By A. M. Smith
his attorney.

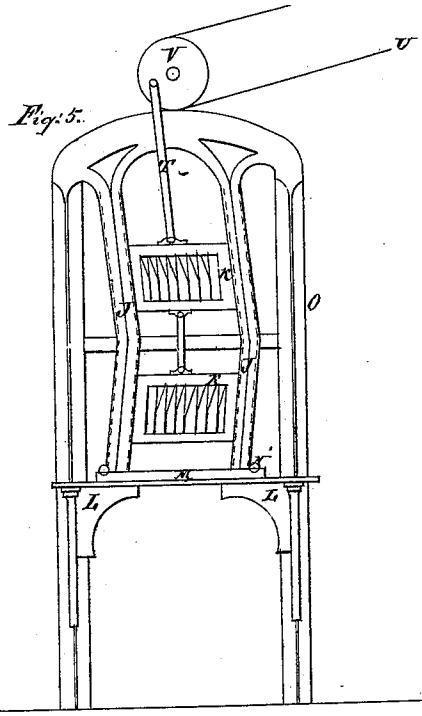
2. Sheets, Sheet 2.

E. Miall Jr.

Saw.

No. 92,080. Patented June 29, 1869.

Fig: 5.



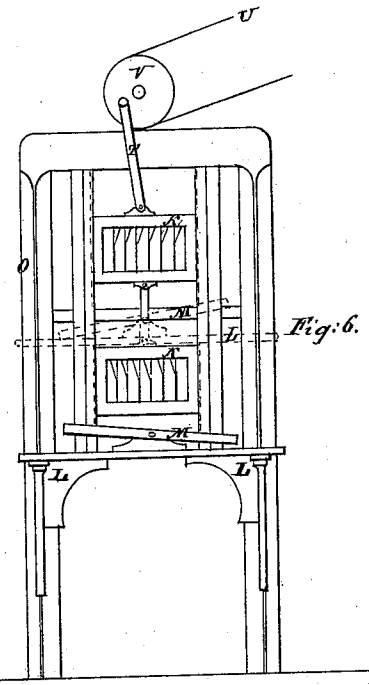


Fig: 6.

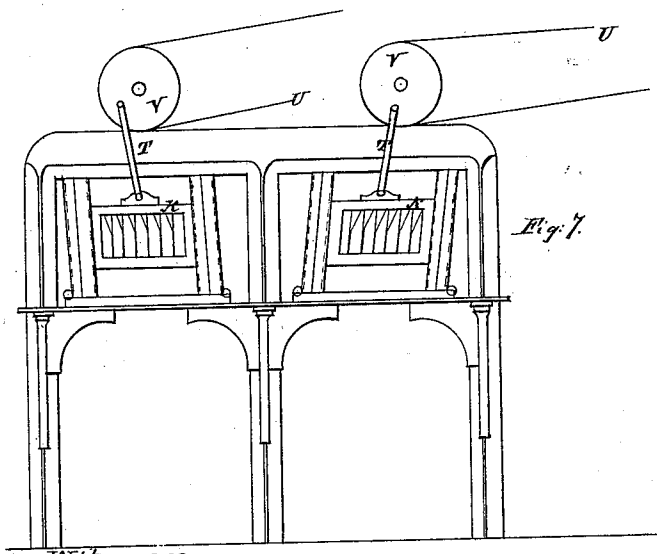


Fig: 7.

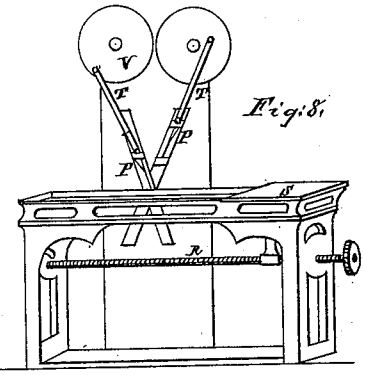


Fig: 8.

Witnesses;
N. N. Doubleday
Alex McMahon

Inventor;
Edward Miall Jr.
by A. M. Smith
Atty.

United States Patent Office.

EDWARD MIALL, JR., OF LONDON, ENGLAND.

Letters Patent No. 92,080, *dated June* 29, 1869.

IMPROVEMENT IN 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, EDWARD MIALL, Jr., of London, England, (now temporarily residing at Oshawa, Dominion of Canada,) have invented a new and useful Improvement in Saws; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents the saw, before the flange, or lip is turned;

Figure 2 represents the saw completed;

Figure 3 is a perspective view of the saw, represented as having completed the slitting-cut, and in position to commence the cut across the grain of the wood; and

Figure 4 is a view of the dovetailing operation completed.

My invention consists of a novel construction of saw, adapted to cut tenons and gains, or mortises, in the form commonly known as dovetailing, and in use by box-makers, cabinet-makers, and others.

It is well known that the process of dovetailing, by any of the ordinary methods, is a slow and tedious one, the fact that the edges of both tenons and gains being mitred or bevelled, instead of being cut at right angles, depriving us of the successful use of the mortising-machines in common use, and compelling us to do the work entirely by hand, or, at best, to complete the operation with the ordinary hand-chisel.

But the nature of my invention will be more fully understood from a description of its construction and operation, which I will now proceed to give.

I make my saw in the usual manner, except as to its shape. For the sake of convenience and economy, I generally make it in the form shown in fig. 1.

I then cut the teeth in the narrowest or front end, raking, as is common in slitting, or rip-saws, and let this form of tooth extend about half the length of the saw. The balance of the teeth are cut with but little or no rake, so as to adapt them to cutting directly across the grain.

I next prepare to turn up a flange, or lip upon the cutting-edge. This I do by laying off the saw as follows:

Having determined the pitch, angle, or mitre of my dovetail, that is, the angle enclosed in the lines *h g i*, fig. 3, I then proceed to describe a similar angle upon the saw, raising the cutting-edge as one side of my triangle.

I next describe a similar one, with apex at the point where the teeth which are set raking for slitting meet those adapted to cutting crosswise of the grain, and turn the portion enclosed by the letters A D E at right angles to the main body of the saw, forming a lip, or flange. Then drill a series of holes through the upper edge, for attaching to an arm or clamp, or some suitable device for driving.

For operating my saws, I usually hang them in a gang, parallel to each other, and accurately adjusted, so that not only the slitting-portion of the blades E D B C, fig. 1, shall be exactly in line with and parallel to each other, but that the lips, or flanges A D E, fig. 1, shall be in exactly the same plane.

The distance between the saws should be a little less than twice the width of the lip at its broadest part, so as to insure cutting the gain, or mortise entirely out, as will be more fully seen hereafter.

Having completed my gang, I hang it upon ways, and attach it, by means of a pitman, to a crank, or adopt any other well-known construction which will enable me to give the saws a direct reciprocating motion, either vertical or horizontal.

I then construct a table upon ways, so that by placing a piece of board upon it, the board can be fed to the saws, either by a suitable device or by hand. The table itself is placed at right angles to the face of the gang, but a little inclined from a right angle, with the blade of each saw, so that instead of making a cut at right angles to the face of the board, the cut shall be bevelled, as shown at *b c*, fig. 3.

Upon this table, I place adjustable stops, or gauges, against which to place the board, so as to secure uniformity of work.

It is necessary to use two gangs of saws; one cutting right-handed, that is, with the lips turned to the right, and one left-handed, or with the lip cutting toward the left.

The operation of my saw is as follows:

I place the board to be dovetailed upon the table, against the stops, or gauges, and press it up against the saw until the saw shall have passed entirely through the board, which will make the cut C *b d e*, or rather a series of them, or one for every saw in the gang.

I then take it to another gang, cutting the other way, and having the inclination of the table reversed, and make the cut *h g f e*. This completes the operation.

They may be operated in many other ways. They may be fixed in two frames, K K, as in Figure 6, the one gang being immediately above the other, so that one table, L M, will suffice.

Figure 5 is a representation of a frame, O, on the face of which is fixed a pair of slides, J J, sufficiently off the perpendicular to give the required slant in the cut C B D, fig. 3.

On the inside edge of these slides J J, a slanting frame, K K, is made to reciprocate, parallel with the sides of which are bars, upon which to fasten the saws.

The saws being fixed upon the frame to the required number, a sliding table, L, is provided at right angles with the face of the frame O.

The top of the table L is grooved horizontally from left to right, when facing the saws, and parallel to the face of the saw-frames K K.

A second top, M, is placed on the table L, and by means of a slide fitting in the said groove, is capable of a lateral motion, while being propelled upward by the movement of the table L, on which it lies.

At either end of the movable table-top, M, a wheel, N, is placed, with a grooved face, which, upon raising the table L, traverses the outer edge of the slides J J, and either edge of these slides being exactly parallel, the one with the other, the wood to be operated on is made to approach the saws in such a way as to cause a slanting cut to be made, while as the tables L continue to rise, the top M follows the direction of the saws.

Instead of a gang of saws, one saw reciprocating vertically, with a slight inclination from the perpendicular, P P, and one with an opposite inclination, may be provided, as in Figure 8.

The table S, fig. 8, instead of rising, is fed horizontally, by a screw, R, the feed of the table being regulated to accord with the speed of saws P P, so as to insure regularity in the saw-cuts.

It will be readily seen, that the description which I have just given applies only to cutting the piece marked H, fig. 4. The counterpart marked H', fig. 4, may be cut by any of the ordinary methods, or by saws constructed upon my principle, but with the lip turned up, at as much less than a right angle as one-half the angle A B C.

These saws require to be set into the frame at such an angle with the face of the frame as may be required to cut the bevel necessary to fit on to the tenons left by the first-described operations, and the relative proportions of the tenons and mortises can be adjusted as fancy or necessity may dictate, and the same saws may be made to out dovetails of any size, from the largest which a given saw is capable of cutting, down to as small a size as we please, without making any change except in the adjustment of the machinery for operating.

Having described my invention,

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

A reciprocating saw, having portions of its cutting-edge occupying different planes, for the purpose set forth.

EDWARD MIALL, JR.

Witnesses:

F. W. GLEN,

P. B. FAIRBANKS.