C. P. S. Mandrell,

Tenoning Machine.

No. 13,735. Patented Oct. 30, 1855.

Fig: 1

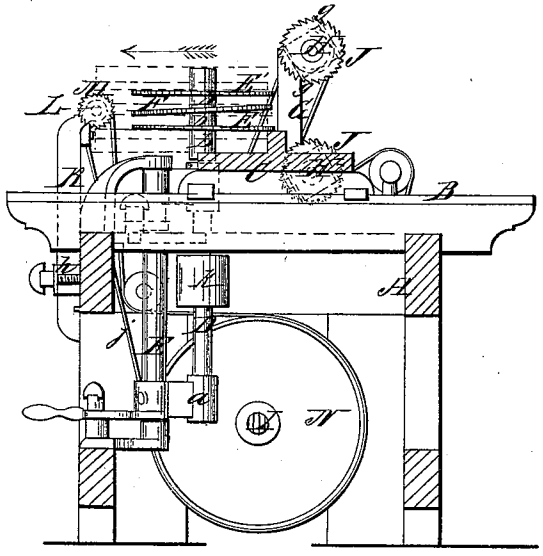
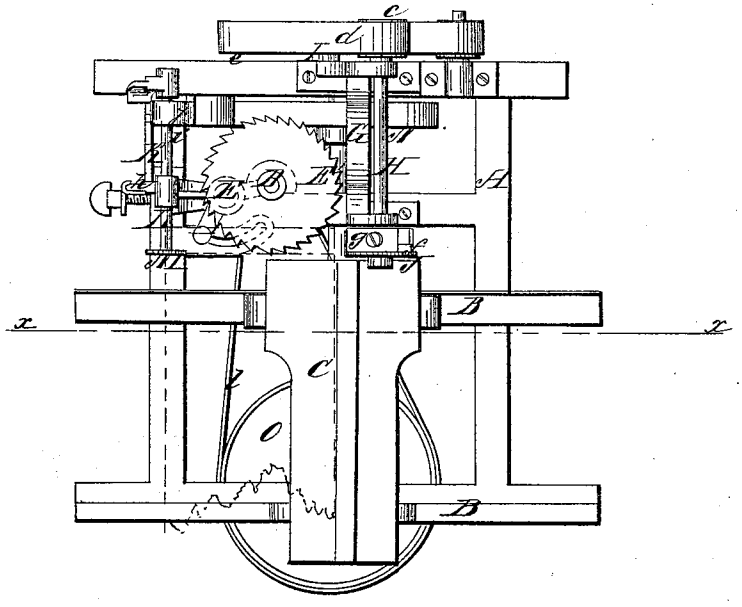


Fig: 2.



AM. PHOTO-LITHO. CO. N.Y. (OSBORNE'S PROCESS)

UNITED STATES PATENT OFFICE.

C. P. S. WARDWELL, OF LAKE VILLAGE, NEW HAMPSHIRE.

MACHINE FOR CUTTING DOUBLE TENONS.

Specification of Letters Patent No. 13,735, dated October 30, 1855.

To all whom it may concern:

Be it known that I, C. P. S. WARDWELL, of Lake Village, in the county of Belknap and State of New Hampshire, have invented a new and useful Improvement in Machines for Cutting Double Tenons; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a transverse vertical section of the machine a portion of which constitutes my improvement, (*x*), (*x*); Fig. 2, showing the plane of section. Fig. 2 is a plan or top view of ditto.

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

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

A, represents a rectangular frame, constructed in any proper manner to support the working parts.

B, B, represent two transverse ways placed on the upper part of the frame, A, on which ways a carriage, C, is placed.

D, represents a vertical arbor which works in bearings (*a*), attached to a vertical shaft, E, so arranged that it may be turned when necessary in order to bring the arbor, D, in different positions. On the upper part of the arbor, D, there are placed three circular horizontal saws, E′, E′, and, F, the upper and lower saws, E, E, are parallel with each other and are hung at right angles with the arbor but the middle saw, F, is hung obliquely on the arbor as clearly shown in Fig. 1. The saws E, E, F, may be placed the desired distance apart by means of collars (*b*), which are placed upon the arbor and between the saws.

G, represents a metallic frame, which is attached to the frame A, on its upper part, and at one side of the arbor, D. This frame has two horizontal shafts H, H, fitted in it, one at its upper, and the other at its lower end. The outer ends of these shafts have pulleys (*c*), (*c*), upon them, around which a belt (*d*), passes, said belt also passing around a pulley (*e*), at one end of a driving shaft, I, at the lower part of the frame, A.

To the inner ends of the shafts H, H, there are attached cylinders (*f*), one to each shaft, and to the outer sides of these cylinders, circular saws, J, are secured, the teeth of which project the distance of their length beyond the peripheries of the cylinders. To the peripheries of the cylinders (*f*), there are attached cutters (*g*), two on each cylinder. The cutting edges of the cutters are flush with the edges of the saw teeth.

K, represents a sliding adjustable frame attached to one side of the frame by means of a clamp (*h*), so that it may be secured to the frame, A, at any desired point. In the upper part of the frame, K, a horizontal shaft, L, is placed, the shaft, L, being parallel with the shafts H, H. To one end of the shaft, L, a vertical circular saw, M, is attached, said saw being in line with the saws, J, and the edges or teeth of the saws E, E, F. To the opposite end of the shaft, L, there is attached a pulley (*i*), around which a belt (*j*), passes, said belt also passing around a pulley N, on the driving shaft, I.

On the arbor, D, there is placed a pulley (*k*), around which a belt (*l*) passes, said belt passing around a horizontal pulley, O, on a vertical shaft which receives its motion from the driving shaft, I, by means of bevel gearing.

Operation: The piece of timber (shown in red) on the end of which the double tenon is to be cut, is placed upon the carriage, C, the end of the piece of timber being at the outer side of the saws, J, and placed beyond the saws, a distance equal to the breadth of the cutters (*g*), (*g*). Motion is then given the driving shaft, I, in any proper manner, and the carriage, C, is moved from right to left on the ways B, B, and the end of the piece of timber is passed between the two saws J, J, which cut transversely in the timber, one saw cut being in the upper and the other in the lower side of the timber, and the cutters (*g*), (*g*), on the cylinders (*f*), take off the wood from the saw cuts, to the end of the piece of timber, leaving a shoulder on each side of the timber, that is one on the upper, and one on the lower side. The end of the piece of timber is then cut by the saws E′, E′, F, which cut horizontally into the end of the piece of timber as far as points in line with the shoulders formed by the saws, J, and cutters (*g*). And as the middle saw, F, is hung obliquely on the arbor, D, it will make a wide cut or kerf, the car-

riage, C, being still moved, the vertical saw, M, enters the piece of timber, and cuts out the wood left between the cuts of the saws E′, E′, and as the center cut, or kerf, is wide, in consequence of the obliquity of the saw, F, the shaft, L, is allowed to pass through it.

The above machine is extremely simple, and operates well in practice, and rapidly tenons of any size may be cut by adjusting the saws, and larger or smaller saws, M, are placed on the shaft, L, according to the work required. It answers equally well for either large or small work.

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

The combination and arrangement, substantially as shown and described, of the intermediate, obliquely set, or drunken, saw (F), with the clearing or finishing, true, circular-saw (M), for operation together in the manner specified, and whereby the drunken saw (F) not only serves to largely reduce the wood betwen the tenons as required for the completion of the tenons, but to form a wide kerf or pathway for the axle (L) of the finishing saw (M), to admit of the deep insertion of the latter into the wood and of its operation as a clearer between the double tenons during the continuous progress or feed of the timber as described.

C. P. S. WARDWELL.

Witnesses:

WM. H. WARDWELL,

M. SARGEANT, Jr.