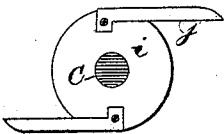
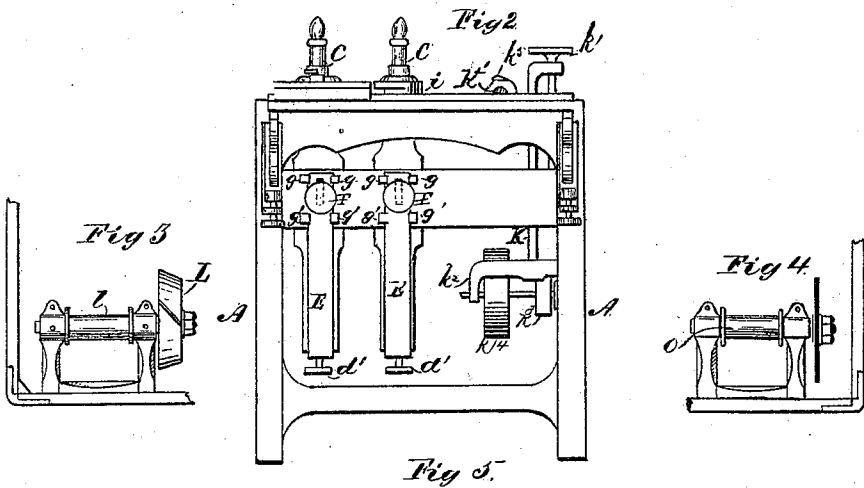
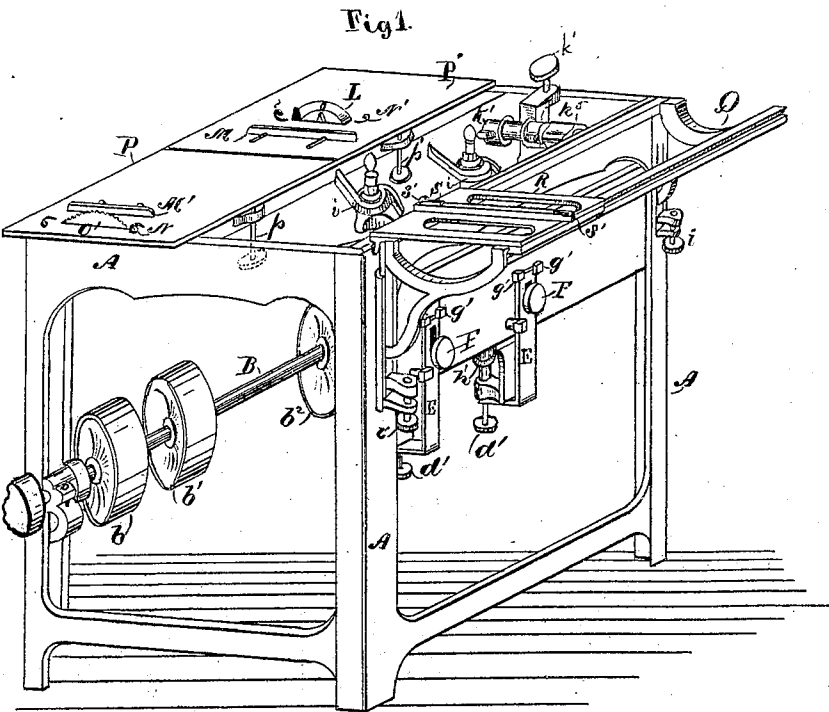


F. D. GREEN.

Dovetailing-Machines.

No. 136,236.

Patented Feb. 25, 1873.



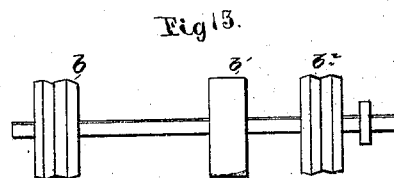
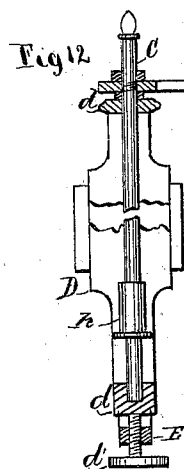
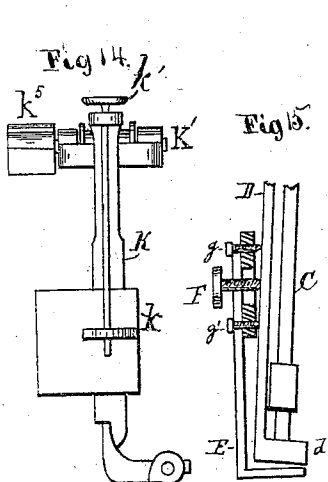
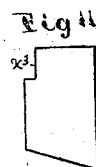
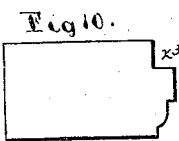
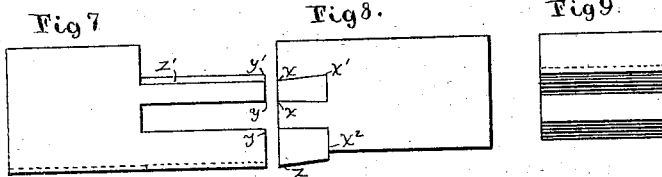
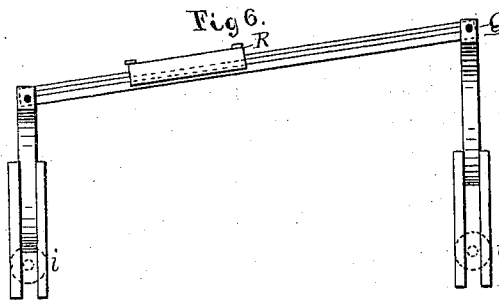
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UNITED STATES PATENT OFFICE.

FRANCIS D. GREEN, OF WILLIAMSPORT, PENNSYLVANIA.

IMPROVEMENT IN DOVETAILING-MACHINES.

Specification forming part of Letters Patent No. 136,236, dated February 25, 1873.

To all whom it may concern:

Be it known that I, FRANCIS D. GREEN, of Williamsport, in the county of Lycoming and State of Pennsylvania, have invented a new Improvement in Dovetailing-Machine; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

This invention is designed for dovetailing and tenoning sash-stuff; and consists mainly, first, in the peculiar construction of the carriage-frame, by means of which it is adapted to be adjusted at unequal heights at the ends; second, in the peculiar means employed for inclining the vertical spindles of the cutters at the various angles desired to cut the inclined sides of the dovetails. It further consists, also, in certain details of construction which, in connection with the foregoing, will be fully described hereinafter.

In the drawing, Figure 1 represents a perspective view of my improved machine; Fig. 2, a side elevation; Figs. 3, 4, 5, 12, 13, 14, and 15, views of various parts detached; and Figs. 7, 8, 9, 10, and 11, views of sash-stuff as cut by my machine.

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

A A represent the frame-work of the machine, constructed preferably of cast-iron, of any proper size. B represents the main shaft, hung in suitable bearings in the frame-work, upon which are located, at proper intervals, the pulleys b^1 b^2 , the pulleys b and b^2 of which are adapted, by means of their peculiar construction, Fig. 13, to receive two belts. C C, Figs. 2 and 12, represent vertical spindles of similar construction, each of which is adapted to hold the cutter-head i , Fig. 5, as shown, and is supported in the bearings d d of the sword D, Fig. 12, the latter being adapted to move vertically between guide-ways upon the frame-work. It is adjusted to any desired height by means of the screw d' attached to the stirrup E, Figs. 1 and 2, rigidly attached to the frame-work, as shown. F represents a threaded pin securely attached at one end to the sword D, which pin extends through the frame-work and the slot of the stump E, and is adapted, by means of a proper nut, to securely fasten

the sword in any desired position. g g g' g' , Figs. 1, 2, and 15, represent set-screws, by means of which the spindles C C may be inclined more or less from the perpendicular for the purpose of adapting the cutters to cut other than horizontal lines. By extending the upper screws g g , the upper part of the spindle is inclined away from the frame, and by extending the lower screws the opposite result is obtained. h , Fig. 12, and h' , Fig. 1, represent pulleys which are adapted to receive a belt, by means of which power is communicated from the pulleys b b^1 upon the same shaft. i , Fig. 5, represents the cutter-head, consisting of a cast disk provided with proper recesses for the knives j , which latter are secured in place by means of screws, as shown. These heads rest upon shoulders upon the shaft, and are secured in place by means of screws, as shown. The cutters j are provided with cutting-edges upon each side and at the end, as shown. K, Fig. 2, represents a sword adapted to support the cutter-shaft K', Fig. 1, which sword is adapted to move vertically in the ways of the beam k , Fig. 14, extending from the frame-work. The sword is adjusted and held in any desired position by means of a screw, k^1 , as shown. k^2 represents arms attached to the lower end of the sword, which furnish bearings for the pulley-shaft, upon which are placed the pulleys k^3 and k^4 . The pulley k^3 is connected, by means of a proper belt, to the pulley b^2 upon the main shaft, and the pulley k^4 to the pulley upon the arbor of the cutter-head, the belt being given a half-turn, as shown, to change the direction of the movement. k^5 represents a cutter-head of the usual construction, which is secured to the arbor in any proper manner. L, Figs. 1 and 3, represents a dado hung upon a suitable arbor located over the main shaft, and receiving power therefrom by means of a belt connecting its pulley l with pulley b upon the main shaft. Its face is made inclined to adapt it to cut the beveled face of the meeting-rail, and its knife is set at an angle, for the purpose of making a drawing cut. The dado is provided also, of course, with the usual clearing openings, in order that it may not become clogged. M M', Fig. 1, represent the usual gage-bars, and N N' springs adapted to hold the work to its place. O represents a revolving saw hung

upon a suitable arbor, and adapted to receive power from the main shaft in any suitable manner. $P P'$ represent divisions of the table, which are hinged on one side, and adjusted to expose more or less of the cutters by means of set-screws $p p'$, as shown. Q , Figs. 1, 2, and 6, represent the frame of the carriage R , which frame is provided with arms having a bearing face adapted to slide in beveled ways attached to the side of the frame. The adjustment of the frame vertically is accomplished by means of screws i , as shown. In order that the frame may be adjusted unequally, to permit the carriage to move upon an inclined line, the arms are connected to the bars forming the carriage-ways by pivot-joints, as shown in Fig. 6. The carriage R is provided with the stop-bar S , having at each end stops s' , by means of which it is adapted to be used when moving in either direction.

The operation of my improved machine is as follows: Motion is communicated to the main shaft in any suitable manner, from any proper source, and from it to the various cutting-shafts by belts, as described. The cutters having been properly adjusted, the machine is ready for operation. If it is desired, for instance, to dovetail stiles, one of the cutters j is set enough higher than the other to make the distance between the planes of their outer edges just the width of the dovetail x , Fig. 8. One of the cutters then has its spindle inclined from the vertical line sufficiently to enable it to cut the proper bevel x^1 . The third cutter, k^5 , is then adjusted to cut the rabbet x^2 , Fig. 8, to the proper depth, either on the upper or lower side of the stile, as the case may be. When thus adjusted, if the stile is properly laid upon the carriage and pushed across the machine, the dovetail with the straight and inclined sides will be cut, and also the rabbet. Now, if the stile be properly passed over the plow O , the groove or rabbet x^3 , Figs. 10 and 11, for the glass, will be cut, and the stile thus completely finished. If it is desired to cut the tenons of the meeting-rail, the cutters $j j$ are adjusted to cut in parallel lines, as indicated at $y y$, Fig. 7, as is also the cutter for taking out the rabbet, as indicated at y' . The face of the rail is thus subjected to the operation of the dado L , by which it is given the proper bevel z , Fig. 8. The groove or rabbet for the glass may then be plowed in it, after which it is returned to the carriage to have the proper bevel z' , Fig. 7, given to the tenon. This result is accomplished

by using one of the cutters properly adjusted to cut in a horizontal plane, and inclining the frame of the carriage; or, if preferred, by placing a properly-inclined block upon the carriage itself.

The described construction possesses many marked advantages. The employment of the cutters described in a single machine enables the workman to completely finish his work before it leaves his hands.

The various adjustments of the cutters, both vertically and at an angle from the perpendicular, render the machine capable of making dovetails and tenons of various angles. The construction of the cutters is such that the surfaces upon which they operate are planed, and consequently smoothly finished.

By moving the frame of the carriage much time and labor may often be saved in adjusting the parts to each other, and, moreover, the independent adjustment of the ends permits an inclined surface from side to side to be cut upon the tenons of the meeting-rails.

The construction of the sword K , with its arms and shaft carrying the pulleys, is advantageous, because, by means of it, the belt conveying the power always remains at the same tension, and no change whatever occurs in it.

The arrangement of the pulleys is advantageous, the pulleys $b b^2$ being adapted to communicate motion to the horizontal shafts overhead and the vertical shafts upon the other sides of the machine.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The carriage-frame adapted to be adjusted unequally at the ends, as and for the purpose set forth.

2. The combination of the adjusting-screws $g g g' g'$ with the sword D of the spindle C and the adjusting-screw d' , as and for the purpose described.

3. The vertically-adjustable sword K , provided below with arms k^2 , pulley-shaft and pulleys k^3 and k^4 , and above with the arbor K' carrying the cutter-head k^5 , all constructed and arranged as and for the purpose set forth.

This specification signed and witnessed this 6th day of November, 1872.

FRANCIS D. GREEN.

Witnesses:

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H. C. CLARK,
EDM. F. BROWN.