

(No Model.)

D. B. WESSON.

PROCESS OF FORMING DOVETAILS IN WOOD.

No. 394,423.

Patented Dec. 11, 1888.

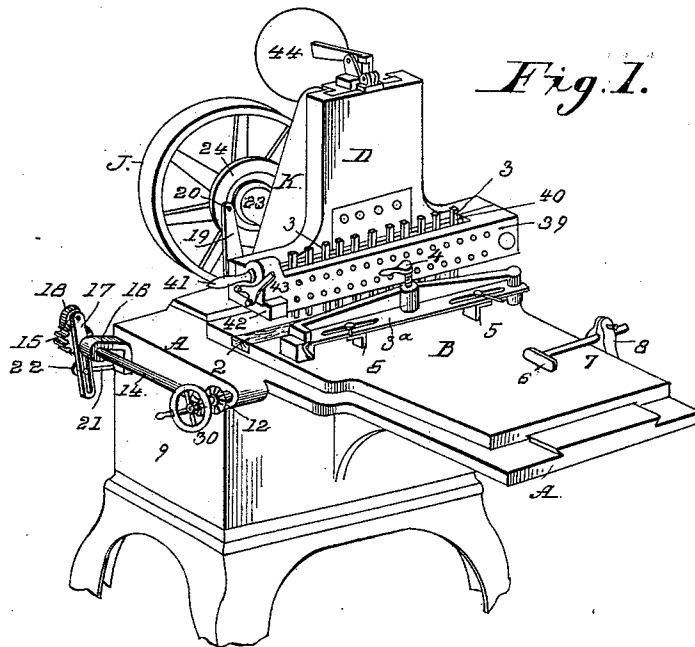


Fig. 1.

Fig. 2.

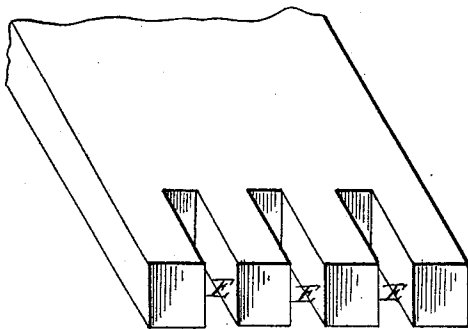
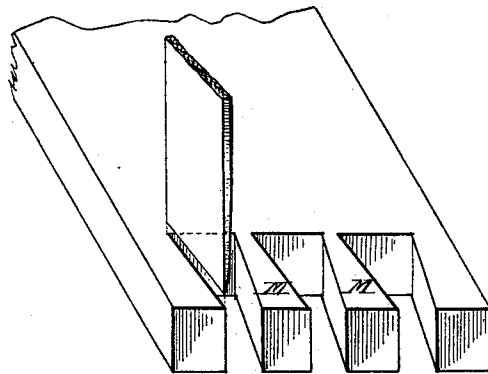


Fig. 3.



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PROCESS OF FORMING DOVETAILS IN WOOD.

SPECIFICATION forming part of Letters Patent No. 394,423, dated December 11, 1888.

Application filed June 11, 1888. Serial No. 276,752. (No model.)

To all whom it may concern:

Be it known that I, DANIEL B. WESSON, a citizen of the United States, residing at Springfield, county of Hampden, and State of Massachusetts, have invented certain new and useful Improvements in the Process of Forming Dovetails in Wood; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

Heretofore it has been the practice to form dovetails in wood by the use of saws and chisels, and by operating to a greater or less extent separately upon each dovetail. Under said method of procedure it is difficult, if not impossible, to produce a series of dovetails in a piece of wood of uniform dimensions whereby they correspond so exactly with the positions and dimensions of dovetail slots similarly made in another piece of wood, that when said two pieces are brought together to be connected one to the other the dovetails and the slots match exactly and produce perfect dovetail construction.

The object of my invention is to provide, by improved processes or operations to which the piece of wood on which dovetails are to be formed is subjected, such means for making said dovetails as results in the production of perfectly-fitting work.

In carrying my invention into effect I employ certain mechanisms which are illustrated in the accompanying drawings, in which—

Figure 1 is a machine having thereon a series of vertically-reciprocating chisels. Fig. 2 is a perspective view of a piece of wood having a series of slots therein as first formed preliminary to making dovetails on said piece. Fig. 3 is a similar view to Fig. 2, but showing completed dovetails on the piece of wood it represents, and the end of a chisel in the operative position it occupies when cutting the sides of the slots in Fig. 1 to form the dovetails.

The steps in the within-described process of making dovetails in wood—that is to say, cutting several parallel-sided slots E, (see Fig. 2,) in the end of a board, to produce the projections or teeth of which the dovetails are to be formed, and then cutting the sides of said projections to make them widest at their ex-

tremities, thereby converting them into dovetails, are performed by the aid of the machine shown in Fig. 1. When said machine is adjusted to operate for the formation of said dovetails, its chisels or cutters 3 are fixed in a position on the cutter-head, whereby their cutting-edges are uniformly in a line at right angles to the longitudinal movement of the bed B under said cutters, and with the chisels or cutters in said position the slots E, Fig. 2, are cut, and for cutting the sides of the projections made by cutting said slots, whereby the dovetails M (shown in Fig. 3) are completed, two more machines are in practice employed, like that shown in Fig. 1, but the cutters of these two last machines are so set that their cutting-edges are at an incline to the longitudinal lines of the said slots, as shown in Fig. 3, whereby said slots are broadened at their inner ends, and the dovetails M are consequently formed.

The details of the construction and operation of the machine illustrated in Fig. 1 are as follows: A is the bed of the machine. A table, B, has a sliding connection with the bed A by means of a dovetail rib and groove on the upper side of the bed and in the under side of said table, whereby the latter is capable of a longitudinal movement on the bed. The table B has fixed in its upper surface in a groove running across it a wooden strip, 2, against which the cutters strike while in operation, as below described. A locking-bar, 3^a, is supported by its ends on the table B, leaving a space between the latter and said bar, so that a board or other piece of wood to be operated on by the machine may be placed between said locking-bar and the table in such way that one end thereof will be brought into proper relation to the cutters or chisels 3. A clamp-screw, 4, is placed in the top of said locking-bar 3^a, having a handle thereon, as shown, whereby said screw is turned against said board which is to be operated upon, thereby holding the latter rigidly in the machine. Two board-guides, 5, are adjustably attached to the under side of said locking-bar by suitable screw-bolts to accommodate the degree of their separation to the width of the board which is to be operated upon. A board-guide, 6, having a shank, 7, thereon, is secured by said shank, which passes through a clamp-

block, 8, to the edge of the table B, said clamp-block being suitably bolted to the edge of the table, and the said guide 6 being adjustable toward and from the center of the table, in order to bring it into line with one of said guides 5 under the locking-bar 3^a. The said table B, when a board is to be secured thereon in which dovetails are to be made, is moved away from the cutter-head D by turning the hand-wheel 9, and said board is secured in such position on the table that the cutters or chisels 3 will begin to cut at the end of said board, and therefrom inward or toward the opposite end thereof, and the requisite movement of the table and said board during the operation of cutting said grooves is imparted to it by turning the hand-wheel 9, and thereby turning the shaft 12, which has a pinion thereon under the table B engaging with a rack on the latter in a well-known manner, said pinion and rack not being shown in the drawings. If preferred, the table B may be fed automatically while supporting a board under the cutters by means of the below-described mechanism, which is shown in Fig. 1.

A shaft, 14, is hung in suitable bearings on the side of the bed A, having a beveled geared pinion thereon which engages with the pinion 30 on the shaft 12. On the rear end of shaft 14 is fixed a ratchet-wheel, 15, and between said ratchet-wheel and the adjoining shaft support or bearing 16 is hung loosely a pawl-lever, 17, capable of a vibratory movement on the shaft 14, and having a pawl, 18, pivoted to its upper end and capable of engagement with said ratchet-wheel.

A lever, 19, is pivoted in a vertical position on the rear side of the bed A. Said lever 19 has fixed in its upper end a stud, 20, and to its lower end is attached one end of a connecting-rod, 21, and the opposite end of said rod is adjustably connected to one end of said pawl-lever 17, the latter having a longitudinal slot therein, through which a screw-stud on the rod 21 passes, and on said screw-stud is a nut, 22, whereby the end of the rod 21 is secured to said pawl-lever at different positions or distances from the end thereof.

The driving-shaft 23 of the machine has a suitable bearing in the fixed head K thereof, said head K being rigidly secured to the bed of the machine in the position shown in Fig. 1, and on said driving-shaft is fixed a grooved cam, 24, in whose groove the said stud 20 on the upper end of lever 19 engages, and on the end of said shaft is fixed a driving-pulley, J. When the machine is in motion, said lever 19 is vibrated and imparts a like motion to the pawl-lever 17, causing the pawl 18 to act upon and impart a reciprocating rotary motion to the ratchet-wheel 15 and to the shaft 14, on which said ratchet-wheel is secured, thereby imparting a like reciprocating rotary motion

to the shaft 12 and a longitudinal motion to the table B of the machine. By swinging the pawl 18 out of engagement with the ratchet-wheel 15 the feed-motion of said table ceases.

The head K is rigidly fixed on the bed A of the machine, and the cutter-head D has a vertically-sliding engagement with the head K. The driving-shaft 23 has a bearing in said head K, and has a crank on the end thereof, which engages with the cutter-head D, whereby the latter is given a reciprocating vertical motion.

The cutter-head D is constructed of the form shown in Fig. 1, and has pivoted thereon by one end a cutter-holder, 39, having a clamping-plate, 40, secured to its inner side by screws, as shown, between which and said inner side the cutters 3 are rigidly clamped, suitable grooves to receive the cutters being formed in the inner side of the cutter-holder. A handle, 41, is fixed in the free end of the cutter-holder 39, to provide convenient means for lifting and swinging over the said holder for the purpose of attaching or adjusting the cutters thereon, or to swing them out of the way, so that the work on the table can be seen. The free end of the cutter-holder rests on an arm, 42, on the cutter-head, and is held thereon by a catch-lever, 43, which is pivoted on said arm and has a hook thereon engaging on a pin in the end of the cutter-holder. Said cutter-holder may, if desired, be secured by each end to the head D by a suitable screw-bolt.

A counterbalancing-weight, 44, is attached to the end of a lever, which is pivoted to the upper end of the head K, and the opposite end of said lever is attached to the cutter-head. Said weight serves to give steadiness to the reciprocating movement of the cutter-head.

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

The process of making dovetails in wood structures, consisting of the following steps, viz: first, cutting in the end of a piece of wood at one operation by a series of cutters having a reciprocating motion at right angles to the plane of said piece, parallel-sided slots in said piece for the separation of the dovetails; second, cutting at one operation and at an incline to the parallel sides of said slots, by cutters having a reciprocating motion toward and from said piece, first one side and then the opposite side of said slots, whereby said dovetails are formed and made widest at their extremities, thereby completing the same.

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