

United States Patent Office.

WILLIAM H. DOANE AND W. E. LONDON, OF CINCINNATI, OHIO.

Letters Patent No. 65,796, dated June 18, 1867; antedated December 18, 1866.

IMPROVEMENT IN WOOD-PLANING MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that we, WILLIAM H. DOANE and W. E. LONDON, of Cincinnati, in the county of Hamilton, and State of Ohio, have invented a new and useful Improvement in Combined Planing, Tonguing, and Grooving or Matching Machines; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal section, taken in a vertical plane through the front part of the machine, arranged for beading and matching flooring-stuff.

Figure 2 is a similar view of the machine, arranged for dressing wide stuff.

Figure 3 is a top view of the machine, arranged as shown in fig. 1.

Figure 4 is a top view of one of the cutter-heads, with its spring chip-breaker.

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

The nature of our invention consists—

1. In so combining removable cutter-heads, spindles, and a revolving planer, in a combined planing and tonguing and grooving machine, that the cutter-heads, with their attaching stems, may be removed, and when they are removed the spindles may remain in a fixed vertical position, and, without being changed from their position, will allow of the passage of wide boards over the planing-bed, under the planer, the arrangement being such that the boards pass over the tops of the spindles.

2. Placing a beading attachment within or upon the pressure-bar of a planing machine, so as to gauge the depth of the bead from and by the surface of the board, and to secure an automatic adjustment of the beading-shaft.

In planing and matching machines, when combined, their importance and utility is in a great measure determined by the facility and convenience with which they can be changed from a surfacing to a matching machine, or to a combined planing and matching machine. This object has heretofore been accomplished generally by removing the vertical or matching spindles from their bearings, or by providing recesses in the side of the frame, to enable them to be moved laterally out of reach of the board, and in some cases mechanism has been employed to drop the spindles, with their bearings and heads, below the board while surfacing. In any or all of these cases the belts for driving the spindles have to be thrown off or removed from the pulleys, while the mechanism for their lateral or vertical adjustment adds to complication and expense in constructing the machine. In our invention, as here presented, the heads can be instantly removed from the spindles, and as the spindles do not pass through the heads, the board passes over the top of the spindles, thus changing the machine from a planing and matching machine to a surfacing machine, without altering the position of the spindles, and when the change is temporary, without removing the belts from the pulleys. The beading-shaft is mounted in the pressure-bar, for several important reasons heretofore described. It has heretofore been mounted upon or attached to some rigid part of the machine, and as its position is determined by the position of the main cylinder, all adjustments had to be made in both shafts where the thickness of the board has varied. In all planing and matching machines the lumber is reduced from the top, and the main cylinder adjusted to the varying thickness; and as the beading-shaft cannot well be mounted in connection with the main cylinder, this invention furnishes the means of accomplishing the same thing by the placing it in connection with the pressure-bar, which is a yielding body, resting upon the board, thus gauging the depth of the bead from and by the surface of the board, and securing a reliable automatic adjustment of the beading-shaft at all times. To compensate for the want of this adjustment, beading attachments have in some instances been placed below the board, when the lumber is reduced to a uniform gauge from its surface, but can only be used on stuff prepared on both sides. For driving such beading attachments, independent shafts have been generally used, or shafts with fixed position. The beading-shaft, as before explained, being adjustable, requires some device for securing a uniform tension of the belt, which our invention provides for by belting from the main cylinder. As before mentioned, all adjustment being common to both these shafts, the belt has at all times precisely the same tension, while the use of an independent shaft is dispensed with and the construction of the machine much simplified.

To enable others skilled in the art to make and use our invention, we will proceed to describe the same, with references to the drawings.

A represents the frame of the machine, which, with its horizontal bed B, feed-roller standards *a a*, and cutter-head support C, may be constructed in the usual or in any other suitable manner. The two pairs of rollers *b b* and *c c*, between which the stuff is passed, and by which it is carried through the machine, may be arranged to operate in the usual manner. In rear of the cutter-head support C, and cutter or planer C', are

the two laterally adjustable matching-cutters D D, which are supported upon the upper ends of vertical spindles E, which have their upper and lower end-bearings in laterally adjustable frames, F F. In rear of the feed-rollers *b b*, and supported at its ends, over the cutter G, is the horizontal pressure-bar H, carrying a transverse shaft *d*, which is to be driven by a belt passing over the pulley *e* on this shaft and a pulley on upper roller-shaft, as indicated in fig. 3. This shaft *d* carries a beading-cutter, *g*, which is arranged so that it can be adjusted in a direction with the length of the shaft, and set at different points thereon, according to the width of the board which it is desired to operate upon. By having the cutter *g* applied to the pressure-bar, it and the bar adjust automatically together. The cutter is also in a position to operate upon the top of the board, and to be driven directly by a belt leading from the shaft of the main cylinder. The pressure-bar H is supported at its extremities by means of pillars, *h h*, to which the bar H is firmly secured by means of set-screws, or in any other suitable manner which will admit of the vertical adjustment of this bar, according to the thickness of the stuff to be passed through the machine. The beading-cutter *g* upon this machine may be removed or adjusted to one side when not required. The cutter *g* is designed for forming beads on the edges of narrow boards, and also in the middle of very wide boards thus prepared shall have the appearance of the narrow boards jointed together. The cutter C¹, which is in front of the matching-cutters, is applied to a sliding-head, C², so that it can be adjusted up or down in the usual manner.

In our combined planing and matching machine, patented November 11, 186, we employed means for adjusting the tonguing and grooving or matching devices to a position above or below the top of the planing-bed, for the purpose of having these devices out of the way, for surface dressing. Instead of adjusting the frames in which the spindles of the matching cutter-heads are supported, for said purpose, we now support said frames, F F, in a more steady position, and apply the cutter-heads D D to the upper ends of the spindles E E, so that, when desired, these heads can be removed with those portions of their spindles which project above the plane of the bed B. This we effect in the following manner, reference being had to figs. 1 and 2 of the drawings: The cutter-heads D D, which may be constructed in any suitable manner, for receiving and carrying the tonguing and grooving cutters, are placed upon screw-stems, *s s*, and suitably keyed thereto. These stems have shoulders formed on them near their lower ends, upon which rest the heads D, and below these shoulders the stems have screw-threads cut on them. The upper ends of the spindles E terminate below the plane of the bed B, and are screw-tapped, for receiving the male screws on the stems *s*. The screw-threads on the stems *s* are cut in an opposite direction to the revolution of their respective spindles, so that the heads and the stems thereof shall not unscrew or work loose during the operation of tonguing and grooving. In some instances a spring-clip, such as shown at *t*, is arranged upon one of the spindle frames, in front of the cutter-head thereon, as shown in figs. 3 and 4. This clip has a spiral spring coiled around its stem, for forcing it, with a constant and even pressure, against the edge of the stuff passed through the machine. This clip is made separate from the support F of the spindle E, and is confined in place by a set-screw *t'*, or by a set-screw and pin, *t' t'*. The object in having the clip separate from the support F is this: When the cutter-head, with the part *s* of the spindles, is removed, the clip *t* must also be removed, in order to allow a wide board to pass over the part E of the spindle, and over the spindle support. There is one clip to each spindle support, but one of these need not have a spring action. In some machines these clips are not used, and hence the removal of the cutter-heads and parts *s* of the spindles will be sufficient, in order to allow of the machine being used as a broad surfacer without disturbing the parts E E of the spindles. By means of the arrangement of the beading-cutter *g* on a separate shaft, and on the pressure-bar above the bed of the machine, the cutter is adapted for operating upon either the edge or corner of a narrow board, or the surface of a wide board, and at the same time may be driven from the shaft of the main cylinder. By having the matching-cutters removable, wide boards can be surface-dressed without requiring to be tongued and grooved or matched. This is not the case with matching-cutters which are simply adjustable from one another in a lateral direction, for although such lateral adjustment may be made, still the matching cutters will be in a position to tongue and groove the boards, unless the boards are narrower than the space between the cutters, and, in that event, to plane wide boards, the machine must be made very wide and unshapely; hence, it is necessary and very desirable to have the matching-cutters removable from their spindles, and it is important also to have the adjustment such as not to require the shifting of the driving-belts, nor the depression of the spindles, as in our former patent.

We do not claim fastening planing-heads to their spindles by means of screw-bolts or studs, nor without passing the spindles through the head; neither do we claim broadly the use of a beading attachment in combination with a planing and matching machine; and finally, we do not claim any one of the elements of the within-described machine singly; nor do we claim removing a planer-head, along with its attaching stem; but what we do claim as our invention, and desire to secure by Letters Patent, is—

1. The combination of two or more removable tonguing and grooving cutter-heads, having attaching stems formed on or applied to them, two or more spindles, with their upper ends below the surface of the planing-bed, and a rotary planer, constructed and arranged so as to operate substantially as and for the purpose set forth.

2. Placing the beading-shaft of a planing and matching machine within or upon the pressure-bar, for the several purposes and in the manner described.

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Witnesses:

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