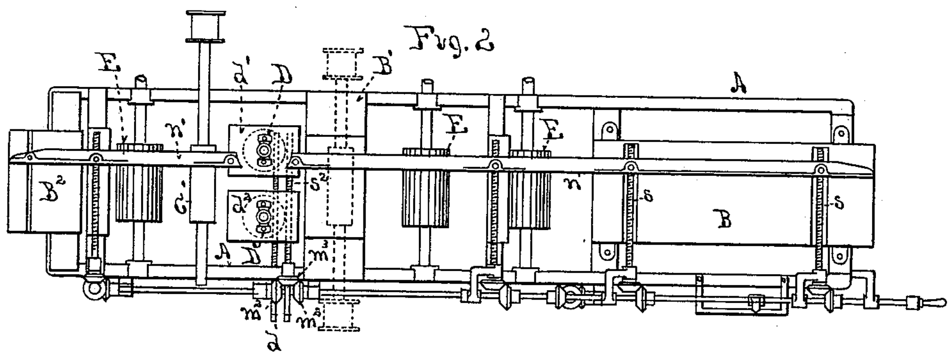
(No Model.)

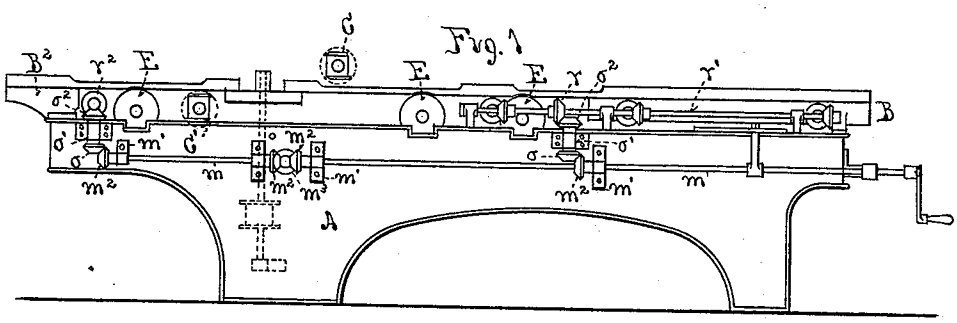
4 Sheets—Sheet 1.

S. A. WOODS.

PLANING AND MATCHING MACHINE.

No. 351,303. Patented Oct. 19, 1886.





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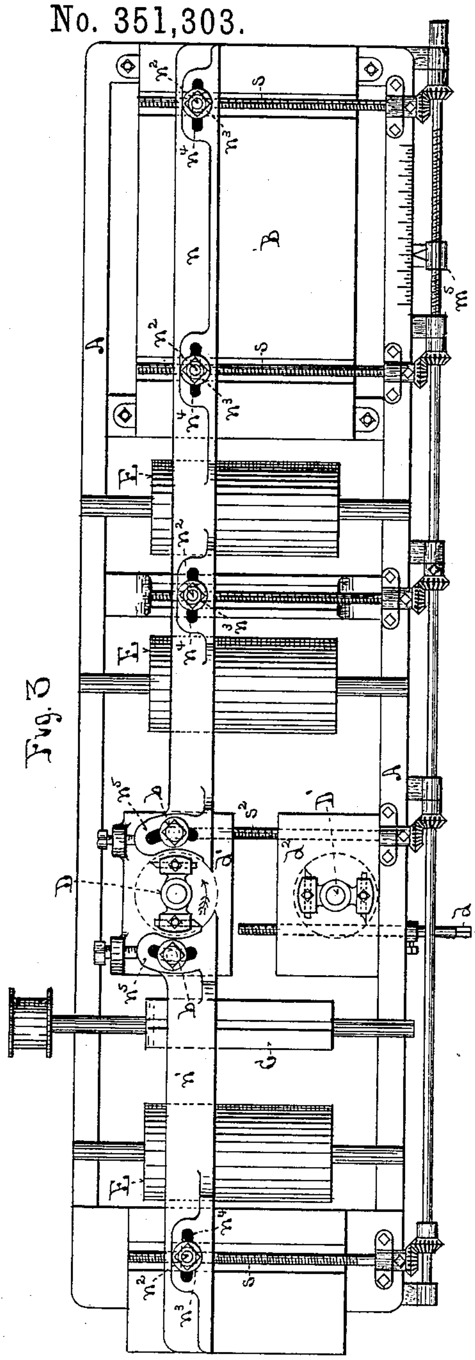

Fig. 3

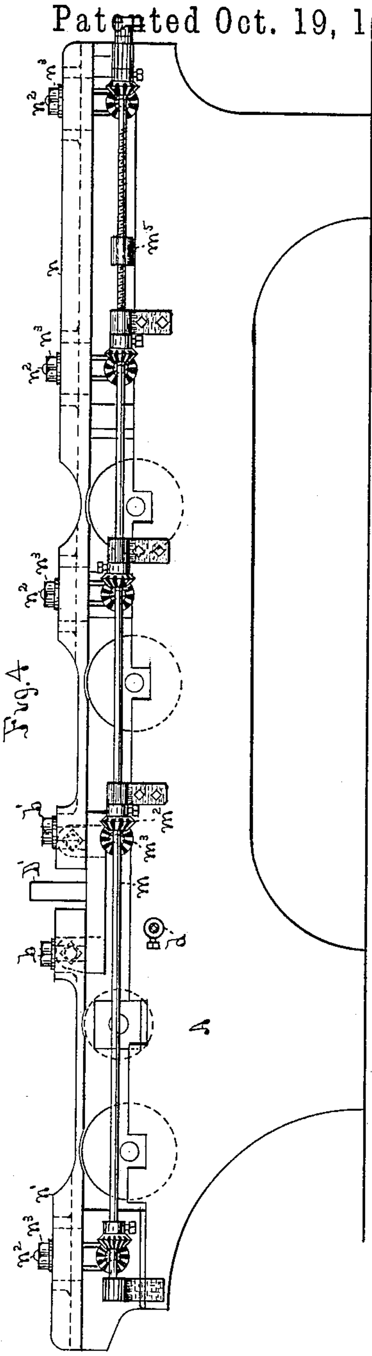

Fig. 4

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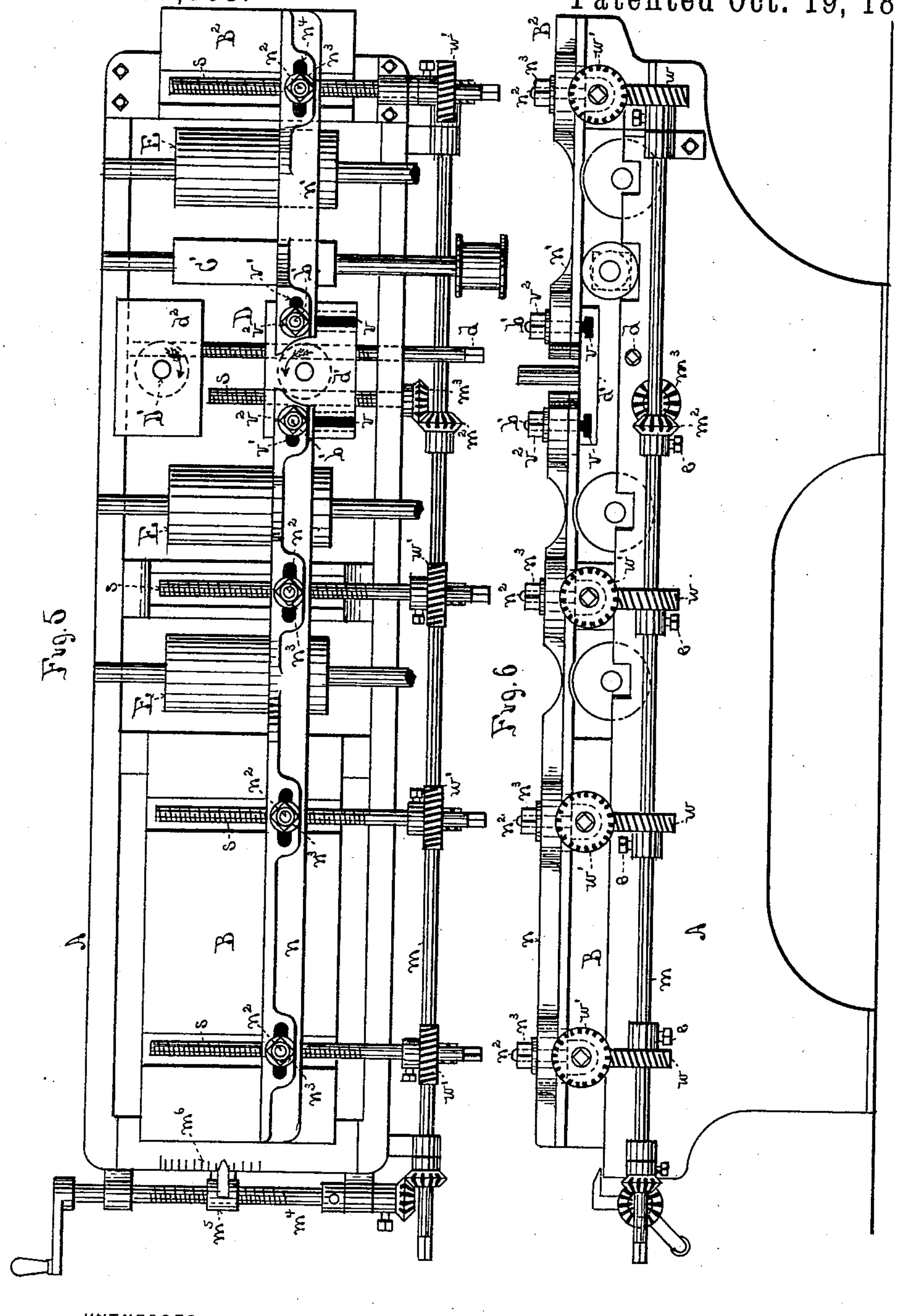

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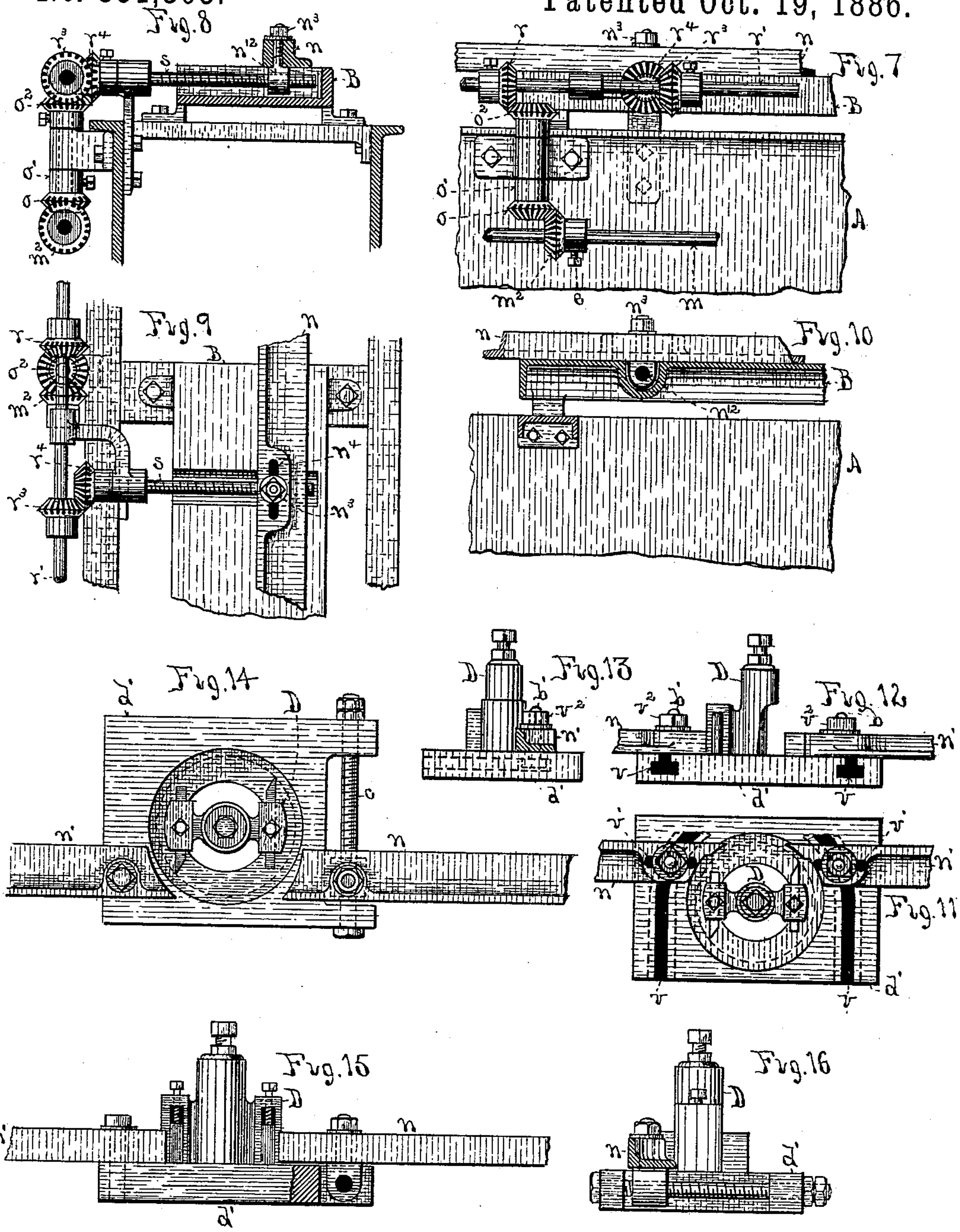

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UNITED STATES PATENT OFFICE.

SOLOMON A. WOODS, OF BOSTON, MASSACHUSETTS.

PLANING AND MATCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 351,303, dated October 19, 1886.

Application filed April 14, 1886. Serial No. 198,879. (No model.)

To all whom it may concern:

Be it known that I, SOLOMON A. WOODS, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Planing and Matching Machines, of which the following is a specification.

My invention relates to machines for planing or dressing lumber; and it consists of certain novel combinations and arrangements of the several parts thereof, substantially as hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of a planing-machine provided with my improvements. Fig. 2 is a top plan view of the same with the upper cutter-head removed. Fig. 3 is a top plan view of a machine provided with a modification of my improvements. Fig. 4 is a side elevation of the same. Fig. 5 is a top plan view of a machine provided with another modification of my improvements. Fig. 6 is a side elevation of the same. Fig. 7 is an enlarged view of a portion of Fig. 1. Fig. 8 is a transverse section of Fig. 7. Fig. 9 is a top plan view of Fig. 7. Fig. 10 is a rear side view of the same. Fig. 11 is an enlarged top plan view of a portion of Fig. 5. Fig. 12 is a side elevation of the same, with the cutter-head partly broken away to show the other parts. Fig. 13 is an end elevation of the same. Figs. 14, 15, and 16 show the former methods of constructing similar parts.

A is the frame of the machine. B is the table or bed. B′ is the solid bed underneath the planing-cylinder C. D D′ are the matching cutter-heads revolving on vertical spindles, and made adjustable independently and transversely of the frame and bed by being mounted in sliding frames or bearings in the usual manner. E E are the feed-rolls for carrying the lumber through the machine. C′ is the lower planing-cylinder. A screw, *d*, is used to adjust the matcher-head D′ across the bed in the usual way. B^2 is the bed or table on the feed-out end of the machine. The bed-pieces B B′ B^2 are bolted to the sides or cross-bars of the frame solidly, as shown. Supplemental bed-pieces d' d^2 are attached to and move with the frame's supporting matcher-heads D D′, and serve to support the lumber as it passes by them in the process of planing and matching. All of these parts are constructed and operated in the usual and well-known manner, and need not be further described.

Heretofore the guides n n', against which the lumber was pressed on one edge to guide it through the machine, have been constructed and mounted so as to be adjustable transversely of the bed, to accommodate different widths of lumber, by screw-shafts s s below the top of the bed-plate, and the matcher-heads have also been adjusted transversely by similar screw-shafts, all these shafts being connected to a single shaft running longitudinally of the machine by worm or bevel gears, so as to be moved simultaneously. This construction was very inconvenient, however, because it failed to provide for any adjustment of the guides n n' and matcher-head D with relation to each other in taking a greater or less depth of cut into the lumber, and this inconvenience offset that of a simultaneous adjustment of the guides and head, as described.

The purpose of my invention is to provide means to overcome this disadvantage, while preserving the advantages of simultaneous adjustment, as described, and also to provide a construction which shall more rigidly hold the guides n n' in position, while allowing the shaft running longitudinally of the machine which adjusts them to be placed below the bed and out of the way of the operator in using the machine.

The shaft m, Fig. 1, runs the whole length of the frame of the machine low enough down to be out of the way of workmen running the planer in dressing lumber. It is supported upon the frame by bearings m', secured to the latter. Attached to it are bevel-gears m^2 m^2. Two of these gears mesh into others, o o, on the lower ends of short vertical shafts o' o', which also revolve in bearings attached to the frame, (see Figs. 1, 7, 8, 9,) as shown. On the upper ends of shafts o' are attached bevel-gears o^2, which mesh with bevel-gear r on the shafts r' and r^2, attached to the screw s, which moves guide n'. On shaft r' are attached bevel-gears r^3, which mesh into bevel-gears r^4 on the ends of screws s. Nuts n^{12} fit the screws s, and have bolts n^2 projecting upward through the guides n n', and secured to the latter by nuts n^3 on top. Opposite the matcher-head

D the shaft m is shown in Fig. 1 as broken, and provided with two bevel-gears, m^2 m^2, which mesh into bevel-gear m^3 on the screw s^2, which moves the matcher-head D and its table d' transversely across the machine; but this shaft m may be continuous, as shown in Figs. 3 and 4, and have only one bevel-gear, m^2.

In Figs. 3 and 4 the shaft m is shown as geared directly to the screws s s^2; but in many classes of machines the arrangement shown in Figs. 1, 7, 8, 9, 10 is superior, since the shaft m, where it passes the planing-cylinders, is in a more convenient position for access to the latter, and the bolts projecting upward from nuts n^{12} through guides n n' are much shorter, thereby holding the latter in position with less strain on the nuts and screws s than as in Figs. 3 and 4.

In Figs. 5 and 6 the shaft m is shown as placed on the back side of the machine and guides n n', instead of the front side, and as operating upon the screws s by worms w and worm-gears w', instead of bevel-gears. A cross-shaft, m^4, provided with a crank at the end of the frame, is geared by bevel-gears to shaft m, and enables the operator to set the guides n n' from the front side of the guides and machine. On this shaft m^4 is a traveling nut, m^5, having a square shoulder bearing upon the frame A to keep it from revolving, and an index-finger over the scale m^6 on the frame. This arrangement serves as an indicator to set the guides n n' at any desired distance from the matcher-head D', or with relation to the cut of matcher-head D. A similar indicator is shown on shaft m in Figs. 3 and 4. To accomplish this latter object, I make the gears m^2 m^2 or w w with short sleeves and set-screws e e, to secure them to shaft m, having heads which can be clamped by a wrench. If, now, it be desired to vary the depth of cut of the cutter-head D, I start the set-screw e upon the gear m^2, which revolves its screw s^2, and also upon the gear m^2, which moves guide n'. By then revolving shaft m guide n will be set at a different gage with relation to cutter-head D, and the set-screws e e may be again tightened up, when guides n n' and cutter-head D will be ready to set at the proper width from cutter-head D'. The guides n n' at their ends adjacent to cutter-head D are made curved or hollowed out to receive the cutter-head and allow their guiding-edges to lap past the circular path of the knives and impart greater steadiness to the cut.

In making the adjustment for depth of cut as above described, it is evident that the end of guide n would be drawn into or away from the path of the knives more or less by the adjustment without special provision for that. I therefore provide the guides n n' with a series of longitudinal slots, n^4, through which the bolts n^2 of nuts n^3 pass, the nuts n^3 being set up against a washer on top of the guides, so as to allow the latter to slide endwise by the movement of the bolts in these slots. At the ends of guides n n', where they overlap table d' of cutter-head D, Figs. 3 and 4, I form curved slots n^5 n^5, having a curve substantially parallel with the curve of the path of the cutters of head D, and transversely of the guides n n'. Bolts b b are fixed in table d', projecting upward through these slots, provided on top with nuts screwed lightly down on washers, so as to allow the movement of the guides on table d'. When the bevel-gear m^2, which adjusts the table and cutter-head, is loosened, and the guide n or n' adjusted to the cutter-head, as before described, the curved slot n^5 in the guide moves it along longitudinally, thus keeping it in the same relation to the cutter-head, whether the depth of cut be more or less.

In Figs. 5, 6, 11, 12, and 13 a modification of this construction is shown, which permits of the guides being set to different lengths of knives in the cutter-head when the knives are changed. Two inverted-T-shaped curved slots, v v, are made in the table d' transversely of the machine from one side of the table. Into these slots bolts b' b' are fitted to slide, the heads fitting the enlarged part of the slots, and the body of each bolt having a shoulder just above the surface of table d', so that the body part of the bolt upward from the shoulder is smaller than the part between it and the head. This smaller upper end of each bolt is made to fit in a slot, v', through the guides n and n', respectively. These slots v' v' are longitudinal of the guides, and on top of the latter nuts v^2 v^2 are screwed upon the bolts, so as to clamp the guides n and n' between them and the shoulders on the bolts beneath the guides. In adjusting the guide n or n' to the cutter-head B, these bolts, sliding in slots v v, operate similarly to the slots n^5 n^5. Shown in Figs. 3 and 4.) When, however, it is desired to fit longer or shorter cutters in the head D, the guides n n' may be fitted to the path of such different cutters by loosening the nuts v^2 v^2, and the guides n n' may be adjusted nearer or farther from the cutter-head to adapt them to the knives.

The advantage of these constructions over former devices is shown by comparison with Figs. 14, 15, and 16, where the guides n n' are shown bolted to the bed d', the former having only a transverse adjustment upon the bed by the screw c, which was not capable of allowing the accuracy of a combined longitudinal and transverse movement of the guides.

It is evident that instead of the gears m^2 or w being made detachable by set-screws, as described, the gears m^3, o, r, r^2, or w' may be so made with similar results, as shown in the drawings, it being only necessary that some one of the gears between screws s and shaft m be so made as to allow of independent adjustment of the guides n n' and cutter-head D.

What I claim as new and of my invention is—

1. The combination of longitudinal shaft m,

attached to the frame below the bed of the machine, vertical shafts o' o', extending upward from shaft m, longitudinal shaft r', four screws, s s s s, guides n n', and cutter-head D, adapted to be moved by said screws, said shafts and screws being geared together, and the latter adapted to be independently disconnected from the driving-gearing, substantially as described.

2. In a planing-machine, the combination of the screw s, provided with a traveling nut below the surface of the bed, the guide n', attached to said traveling nut by a slot-and-bolt mechanism allowing it to be moved longitudinally, and the table d', carrying cutter-head D, and attached to said guide near one end by the bolt, and the curved slot passing transversely of said guide and corresponding with the cutter-head, whereby the adjustment of the guide n' by screw s adjusts the end of the same to the cutter-head, substantially as described.

3. In a planing-machine, the combination of one or more screws, s, provided with traveling nuts n^{12} below the surface of the bed, the guide n, attached to said nut or nuts by a slot-and-bolt mechanism allowing it to be moved longitudinally, and provided with slot v', the table d', provided with curved T-shaped slot v, and the bolt b', fitting said slot and connecting said guide and table together, and allowing the former to move across the latter transversely of the machine in a path parallel, or nearly so, to that of the cutter-head, substantially as described.

4. The combination of shaft m, screws s s, provided with traveling nuts, the guide n and cutter-head D, connected to said nuts, and the gear mechanisms connecting said shaft m and screws s s, and attached thereto by set-screws e e, whereby said shaft m is adapted to be detached from said guide or cutter-head, substantially as described.

5. In a planing-machine, the combination of two or more screws, s s, provided with traveling nuts n^{12} below the surface of the bed, the guides n n', attached to said nuts by a slot-and-bolt mechanism allowing them to be moved longitudinally, and provided with slots v' v', the table d', provided with curved T-shaped slots v v, and the bolts b' b', fitting said slots and connecting said guides and table together, and allowing the former to move across the latter transversely of the machine in a path parallel, or nearly so, to that of the cutter-head, substantially as described.

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