

(No Model.)

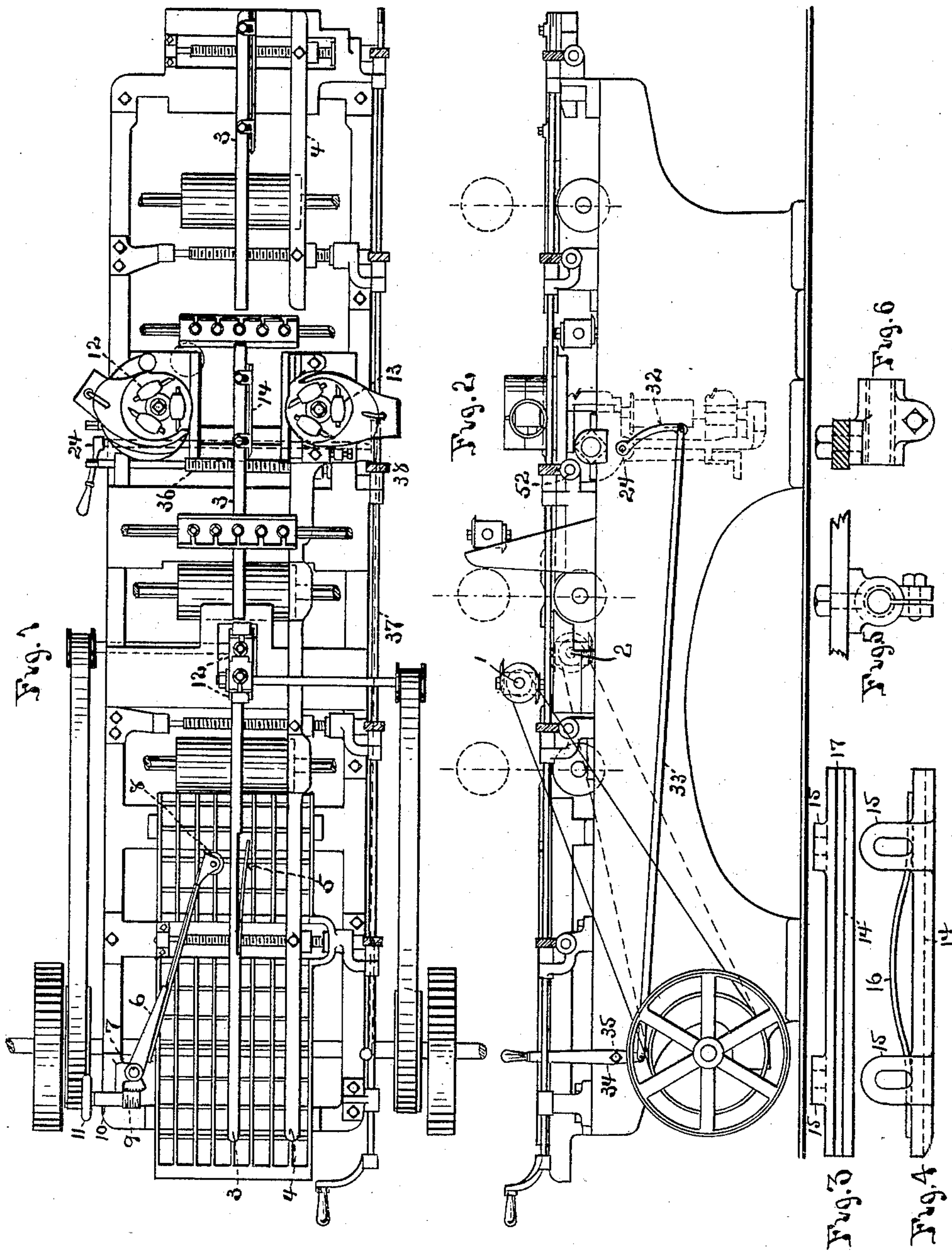
2 Sheets—Sheet 1.

S. A. WOODS & J. R. THOMAS.

PLANING MACHINE.

No. 397,575.

Patented Feb. 12, 1889.



WITNESSES:

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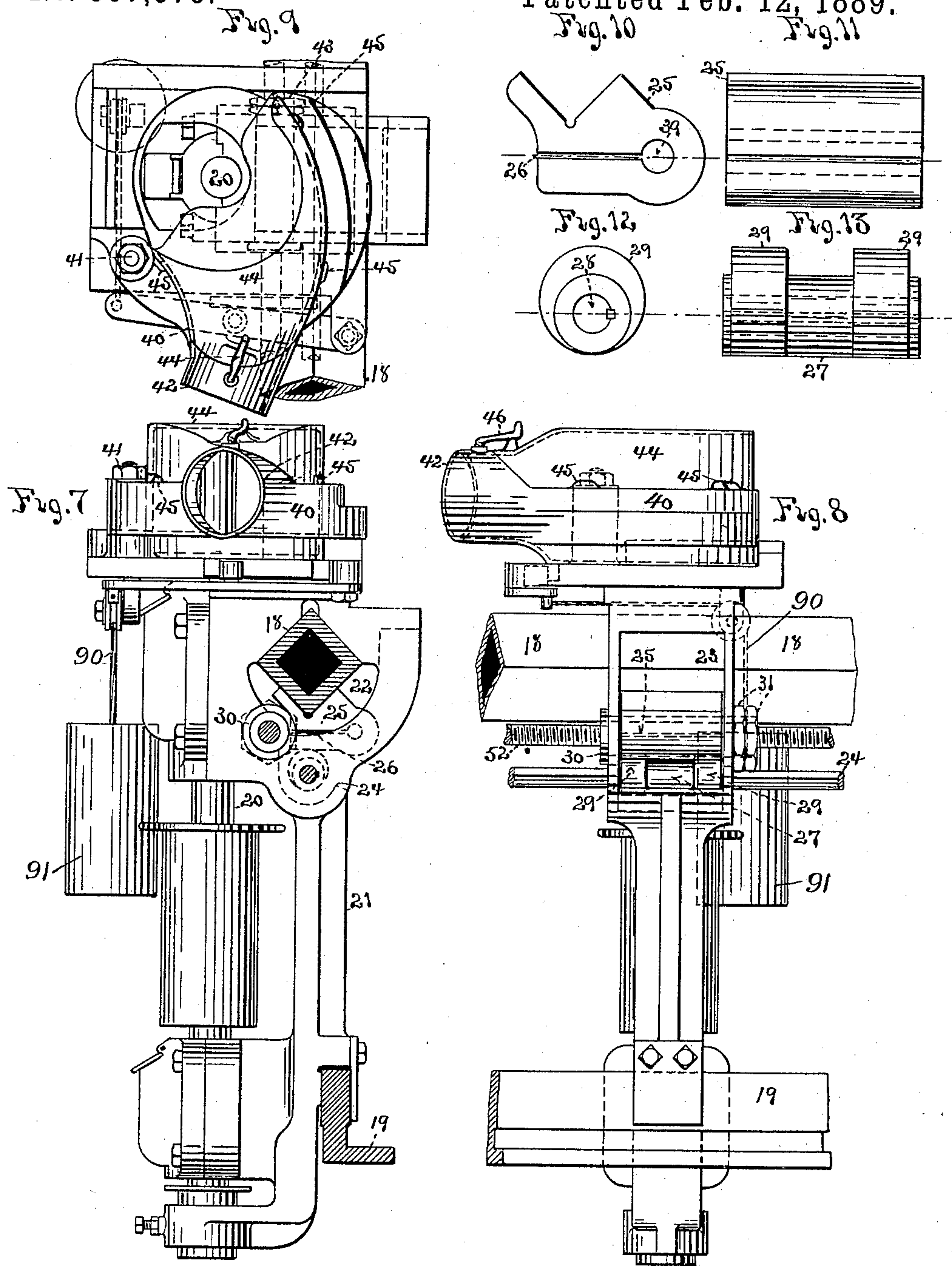
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PLANING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 397,575, dated February 12, 1889.

Application filed March 21, 1888. Serial No. 268,038. (No model.)

To all whom it may concern:

Be it known that we, SOLOMON A. WOODS and JOHN R. THOMAS, both of Boston, in the county of Suffolk and State of Massachusetts, have invented a certain new and useful Improvement in Planing-Machines, of which the following is a specification.

Our improvement relates to planing-machines; and it consists in certain new and useful constructions and combinations of the several parts thereof, substantially as herein-after described and claimed.

In the drawings, Figure 1 is a top plan view of a planing-machine provided with our improvement, having the stands and upper feed-rollers left off for the sake of clearness of illustration. Fig. 2 is a side elevation of the same. Figs. 3, 4, 5, and 6 are detail views of the construction of the central guide as applied to the same. Fig. 7 is an elevation of one of the vertical tonguing and grooving cutter-heads, with parts of the frame to which it is attached in section. Fig. 8 is an elevation of the same at right angles to Fig. 7. Fig. 9 is a top plan view of the same. Figs. 10, 11, 12, and 13 are detail views of parts of the mechanism connected therewith.

The machine shown in the drawings is what is commonly known as a "duplex" machine, which is capable of planing two boards at a time, having horizontal tonguing and grooving heads 1 2, located above and below the path of the lumber through the machine, and so as to operate upon the upper and lower surfaces of the same, and a central guide, 3, for tonguing and grooving and guiding the inner edges of the boards. On one side of the machine is also located the side guide, 4, which is adjustable away from and toward the center of the machine. These guides and the relative position of the heads 1 2 are substantially as shown in the patent granted to Solomon A. Woods, June 14, 1887, No. 364,743.

In passing two boards through the machine at once one of them takes a bearing against the guide-strip 4 upon its edge and the other upon the central guide-strip, 3. To hold the board against the side guide-strip, 4, we attach to the central guide-strip, 3, an elastic spring, 5, which presses the board on that side

over against the guide 4, as it enters the machine, and insures the accurate operation of the cutter-heads 1 and 2 in reducing it to a proper width and tonguing and grooving its inner edge. When the central guide-strip, 3, is removed to use the machine as a single planer, this spring 5 goes with it, and when the central guide-strip is replaced it is in position for use.

On the opposite side of the central guide, 3, from spring 5 the edge of the board passing through takes its bearing, and to hold it snugly against this guide we employ the swinging elastic arm 6, turning upon a vertical shaft or pivot, 7, and carrying the roller 8 upon its inner end, which bears against the outer edge of the board and keeps it in contact with the central guide. The sleeve of the arm 6, which turns upon its pivot, has a toothed sector attached thereto, which engages with the worm 9 upon the shaft 10. By means of the attached hand-wheel 11 this worm is turned and adjusts the arm 6 for different widths of boards within the limits of its elasticity. This arm 6 is long enough to be employed to press the lumber against the side guide, 4, when the central guide, 3, is removed.

As the lumber which is held against the side guide, 4, may have different widths taken off its inner edge by the cutters of heads 1 and 2, and as the interposition of the central guide between the outside matcher-heads, 12 and 13, prevents the pressure of the yielding chip-breaker of head 12 from holding the board upon the opposite side of the central guide, 3, against the action of the cutter-head 13, it is found desirable to attach to the central guide-strip, 3, opposite to matcher-head 13, a pressure strip or bar to hold the board to its place against guide 4 and that head. This pressure-strip 14 is attached to guide 3 by ears 15 15, Figs. 3 and 4, which overlap the top of the guide 3, and are provided with elongated slots, through which the shanks of screw-bolts pass, the heads of the bolts overlapping the ears and their lower ends being screwed into guide 3. This arrangement allows of the pressure strip or bar 14 being adjusted to hold different widths of boards to the matcher-head 13.

A steel spring, 16, may be placed behind the pressure-strip 14, if desired, and the bolts through the ears 15 left loose enough to allow the pressure-strip to yield and adjust itself to any difference in the width of the boards passing through. This spring also allows the pressure-strip to rock slightly to adjust itself to the edge of the incoming board. The pressure-strip 14 has a longitudinal groove or spline, 17, through its bearing-face parallel with the bed of the machine, to fit the corresponding tongue or groove formed by the heads 12 in the edge of the board and prevent injury to the latter. This groove or spline may, however, be omitted, as the pressure-strip can act without it; but we prefer to employ it.

Figs. 5 and 6 show respectively end and side views of the sleeve-nut attached to the side guide, 4, by which it is attached to the screws which adjust the guide transversely of the bed. As these nuts are of ordinary and well-known construction, they will be understood without further description.

For the support and transverse adjustment of the matcher-heads 12 and 13 across the machine we employ the following construction, Figs. 7 to 13: A girt, 18, having its exterior polygonal in cross-section, is secured transversely across the frame of the machine by its ends and with one corner or angle above either of the others, substantially as shown. Below this girt the usual cross-girt, 19, is secured in the frame by its ends. The matcher-spindle 20 revolves in boxes attached to the yoke 21 in the usual manner. Through the upper part of this yoke, which is enlarged at that part, a transverse aperture or opening, 22, is made entirely through it. This opening is made to fit the girt 18, having its faces on the upper side which embrace the girt like a saddle parallel with the latter, so that these two upper faces embrace and fit over the upper angle of the girt, as shown in Fig. 7. The girt 18 is passed through this aperture 22 and secured in a position parallel to the girt 19 and at such a height that the entire weight of the yoke 21 rests upon it, the girt 19 serving to steady the yoke in a lateral direction only. The entire weight of the yoke through its saddle being thus brought to bear upon the upper angle of girt 18 and resting equally upon the faces of this angle, any wear will act equally upon these faces, and the yoke and spindle will be kept constantly in the same lateral position in the machine.

Through the side of the yoke shown in Fig. 8 a rectangular-shaped opening, 23, is formed, reaching in its upper part into opening 22. A round hole is made through the yoke, parallel to girt 18, and in this is placed the shaft 24, provided with a spline-groove upon one side of it and supported in the frame of the machine in bearings at its ends so as to revolve and allow the yoke 21 to slide along over it. The shaft 24 passes through the

lower part of opening 23. An under saddle or gripping-piece, 25, is made of the proper shape to embrace the lower side of girt 18, and just long enough to enter pocket or opening 23. Underneath the saddle, or embracing part of this piece 25, it has a slot, 26, made through it from one side to the hole 39. As the piece 25 is made of steel, this slot affords an elastic grip or clutch upon the girt 18, as hereinafter described.

A sleeve, 27, is made with a splined hole, 28, through it to fit the grooved shaft 24 and slide on the latter. This sleeve is just long enough to enter the opening 23 in the yoke when placed on its shaft. On the outside of sleeve 27 are formed two cam-shaped projections, 29 29, although only one might be employed, if preferred, without departing from the substance of our invention. When the girt 18 is in place in the opening 22, the gripping-piece 25 is slipped under it through opening 23, being held from endwise movement by having its ends bearing against the sides of the latter. The cam-sleeve 27 is then slipped into the opening 23 under piece 25, the ends of the sleeve bearing against the sides of the opening closely. The shaft 24 is then slipped through the hole 28, the spline of the hole fitting its groove. This locks all the parts in place, and the several parts are so proportioned that by revolving the shaft 24 the cams 29 are brought against the lower face of locking-piece 25, forcing the latter up against the lower side of girt 18 and locking the yoke 21 firmly to the girt. As the yoke may be slid along over the girt and over shaft 24, this locking action can take place at any point desired upon the girt, thus enabling the matcher-spindle 20 to be secured at any point at which it may be adjusted transversely of the machine.

Through the yoke 21, just inside of the openings 22 and 23, a hollow or tubular bolt is passed in a hole made for the purpose. The head of this bolt 30 takes a bearing upon one side of yoke 21, while a double nut, 31 31, is screwed onto the other end of the bolt, clamping it firmly in the yoke. The bore of this bolt has a thread cut through it, and in this is fitted the thread of the long screw 52, which is supported in journals in the sides of the machine-frame, and extends transversely across, parallel with girt 18. The other matcher-head of the machine is provided with a yoke and clamping attachments like those above described, through which the girts 18 and 19 and shaft 24 pass, as above described. The turning of the shaft 24 therefore secures both cutter-heads simultaneously to girt 18, or simultaneously unlocks them therefrom.

The employment of a polygonal-shaped girt for supporting the yoke of the matcher-spindle enables us to take a firmer grip than with a round one, and by placing one corner of the polygonal-shaped girt uppermost and gripping the yoke to it from beneath we in-

sure the perfect alignment of the matcher-spindle at all times and the minimum of wear on the girt. This grip is so powerful and so easily worked, and exercises so equal a grip upon both of the matcher-spindle yokes, that we have found it feasible to operate it from the feed-in end of the machine. For this purpose we attach to one end of shaft 24, which extends beyond the side of the machine-frame, a crank-arm, 32, and to the outer end of this (Fig. 2) pivot a rod or link, 33, which is pivoted at the other end to the lower end of lever 34. The latter is pivoted upon the side of the frame by its fulcrum 35, and has its free end projecting within reach of the operator at the feed-in end of the machine. By moving the lever 34 the matcher-heads may be unlocked from the girt 18, and as the screw 36 of the other matcher-head (corresponding to the screw 52 of the head shown in Figs. 7, 8, and 9) is geared to the shaft 37 by the worm 38 the matcher-head 13 may be adjusted transversely of the machine by turning the crank 32, attached to shaft 37, within reach of the operator at the feed-in end of the machine. After the position of the matcher-head has been thus adjusted it can be relocked in place by the lever 34, as before described. Thus the operator can unlock and adjust the matcher-head to different widths of lumber and relock it without leaving the place where he is feeding in the lumber, and with the greatest celerity and certainty.

Another part of our invention relates to the combined chip-breaker and funnel for carrying off the chips and shavings from the matcher-head. The combined chip-breaker and funnel 40 is pivoted to the table of the matcher-head by pivot 41, and surrounds and partially covers the head in the shape of a casing or box terminating in the spout part 42. The bearing part of the chip-breaker upon the lumber is at 43. The cord 90 (and its weight 91) is attached to the chip-breaker and serves to press its bearing part against the lumber, the cord being carried over pulleys, some of which are not shown in the drawings, between the weight and chip-breaker to carry it in the proper direction. Heretofore this construction of chip-breaker and funnel has been inconvenient, because it was difficult to get at the knives on the matcher-head, the cover part of the funnel being in the way, and for the same reason the cover part of the chip-breaker did not extend far enough over the head. We obviate this difficulty by making the cover part of the chip-breaker detachable, so that it may be readily removed and replaced. The cover part 44 rests on top of the larger lower part, and is held in place by the clips 45 45 around its lower edge and the turn-button or spring-lever 46 engaging with the notched ear 47 on its top. This lever 46 is pivoted upon the stationary part of the chip-breaker, and presses the cover 44 upon the other part. By making the cover part detachable we are en-

abled to make it cover more of the head with its upper wall or surface than would otherwise be possible, and thus gather the chips more effectually and discharge them through the funnel-spout 42.

What we claim as new and of our invention is—

1. The combination, in a wood-planing machine, of the matcher-heads 1 and 2, mounted upon horizontal shafts above and below the path of the lumber, the matcher-head 13, mounted upon a vertical shaft outside the path of the lumber, the side guide, 4, and the central longitudinal guide-strip, 3, having attached upon the side thereof, toward said side guide and opposite matcher-head 13, an adjustable supplemental guiding-strip, 14, substantially as described.

2. The combination, in a wood-planing machine, of the matcher-heads 1 and 2, mounted upon horizontal shafts above and below the path of the lumber, the matcher-head 13, mounted upon a vertical shaft outside the path of the lumber, the side guide, 4, and the longitudinal central guide, 3, provided with the elastic spring 5, attached to the side thereof opposite said side guide and arranged to press the lumber against the latter, substantially as described.

3. The combination of the polygonal-shaped cross-girt 18, secured at its ends to the frame of the planing-machine, with one corner uppermost, the yoke 21, carrying the matcher-spindle and mounted upon said girt by a saddle embracing its upper angle and faces, and a clamp attached to said yoke and arranged to bind said girt between it and the saddle, substantially as described.

4. The combination of the polygonal-shaped cross-girt 18, with one corner uppermost, the yoke 21, carrying the matcher-spindle and mounted upon said girt by a saddle embracing its upper angle and faces, the clamp-piece 25, embracing the girt on its sides opposite to the saddle, and a cam, 29, arranged to bind against said clamping-piece, substantially as described.

5. The combination of the polygonal-shaped girt 18, secured with one corner uppermost, the yoke 21, carrying the matcher-spindle and mounted upon said girt by a saddle embracing its upper angle and sides, the clamping-piece 25, embracing the girt on its sides opposite to the saddle, the cam 29, and an elastic or yielding medium intervening between said cam and the embracing part of clamping-piece 25 and arranged to transmit the pressure of the cam to the clamping-piece, substantially as described.

6. The combination of the girt 18, the yoke 21, carrying the matcher-spindle and mounted upon said girt by a saddle embracing the same on one side, the clamping-piece 25, embracing the same on the opposite side, the cam 29, arranged to compress the clamping-piece against the girt, the splined rod 24, passing through said cam and arranged to

revolve the latter and allow it to be slid over it, the screw 52, journaled in the frame and arranged to move yoke 21 along the girt by means of its sleeve-nut attached to the yoke, 5 and the crank 32, rod 33, and lever 34, connected to the splined shaft 24, leading to the feed-in end of the machine, and the gear 38 and shaft 37 with its crank at the same end of the machine, whereby the operator is enabled, without leaving that end of the machine, to release the yoke 21 and adjust and secure the same to the girt 18 to suit different breadths of lumber, substantially as described. 10

15 7. The combination of the matcher-spindle 20 and its head, and the chip-breaker 40, surrounding the same and made in the shape of an inclosing-funnel around said head terminating in the exit-spout 42, the said inclosing-

funnel having its upper portion in the form of a detachable cover secured to the lower portion by lugs or fastenings, substantially as described, whereby said cover portion may be removed and the head exposed, substantially as described. 20 25

8. The combination of the chip-breaker 40, pivoted to the table of the vertical matcher-head by pivot 41, swinging in a curved path around said head and provided with spout 42, and the cover part of the same, 44, extending over said head and secured to the lower portion by lugs 45 and turn-button 46, substantially as described. 30

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