

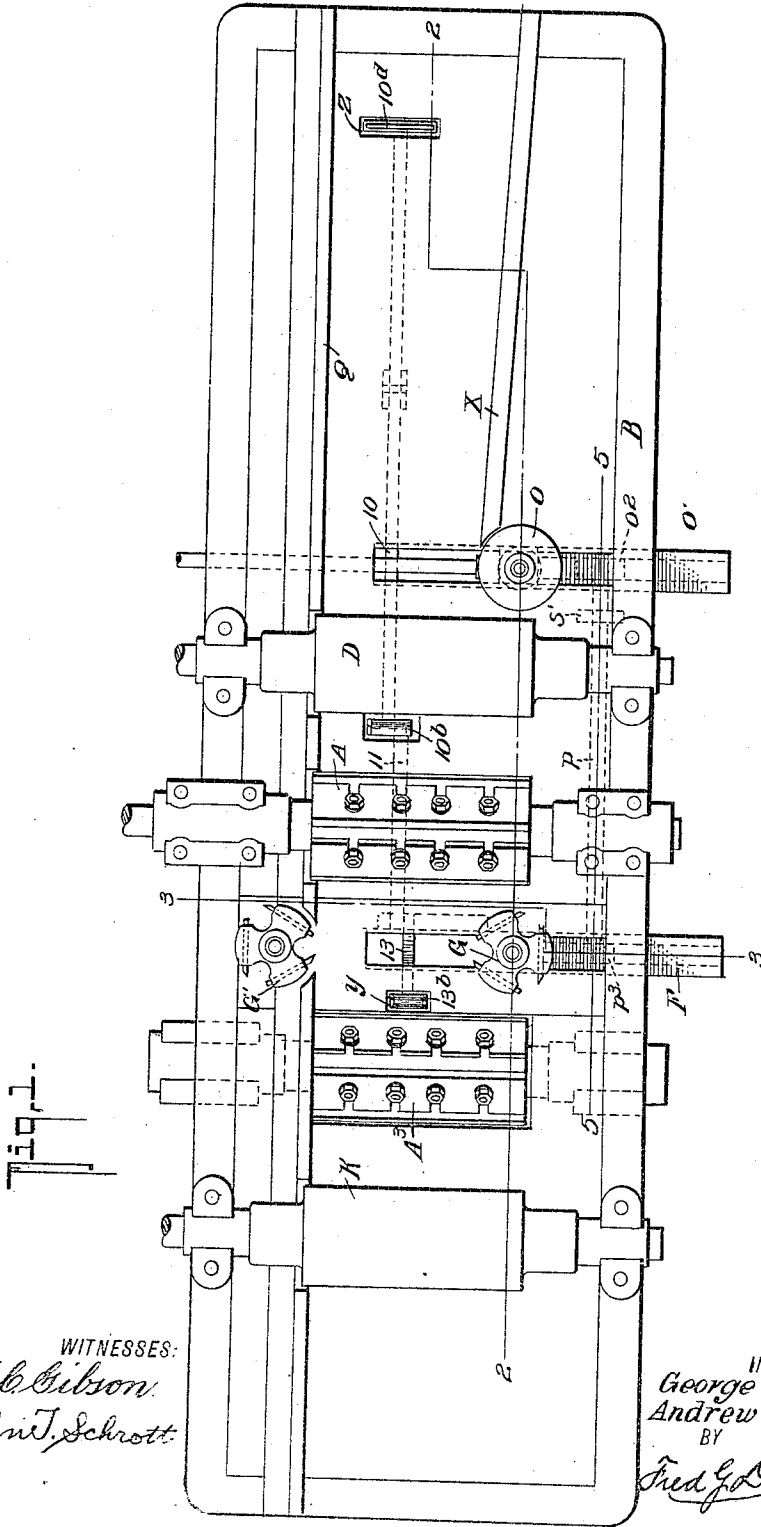
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PATENTED SEPT. 4, 1906.

G. A. SMITH & A. C. STRICKLAND.
PLANING MACHINE.

APPLICATION FILED MAR. 10, 1905.

3 SHEETS—SHEET 1.



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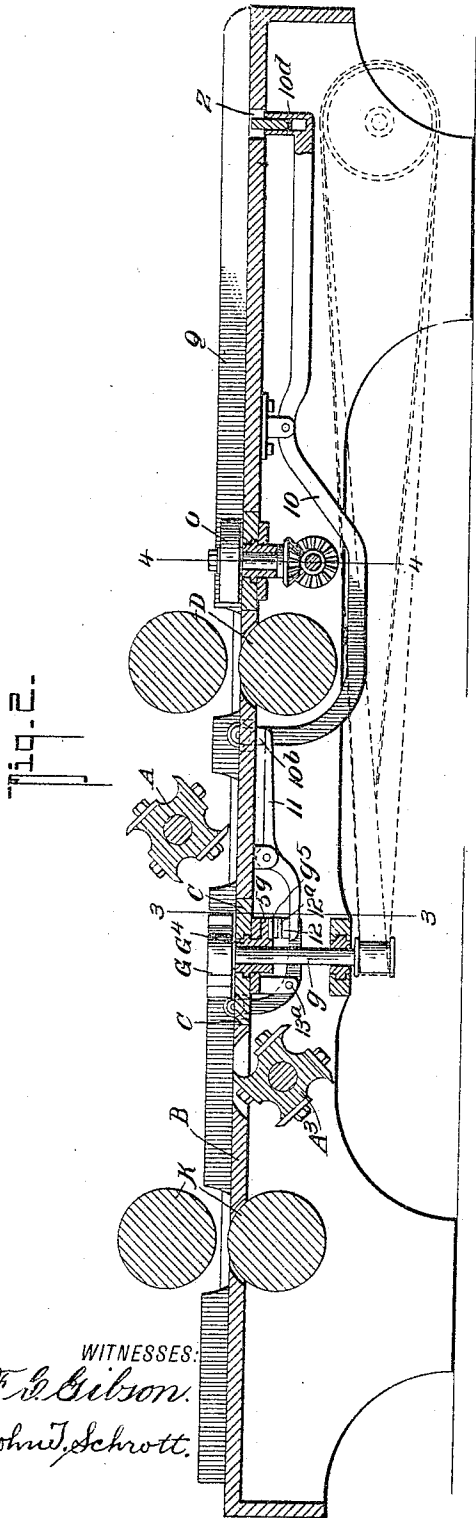


Fig. 2.

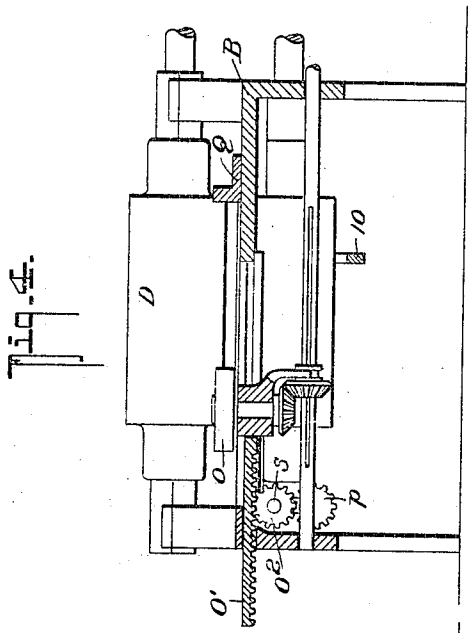


Fig. 4.

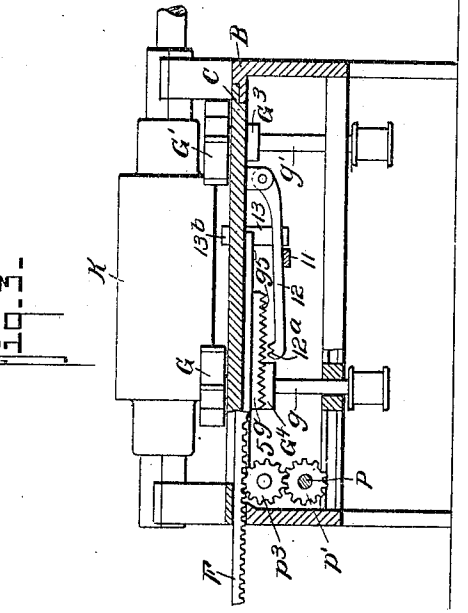


Fig. 3.

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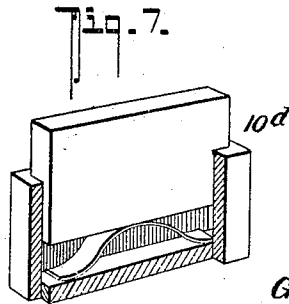
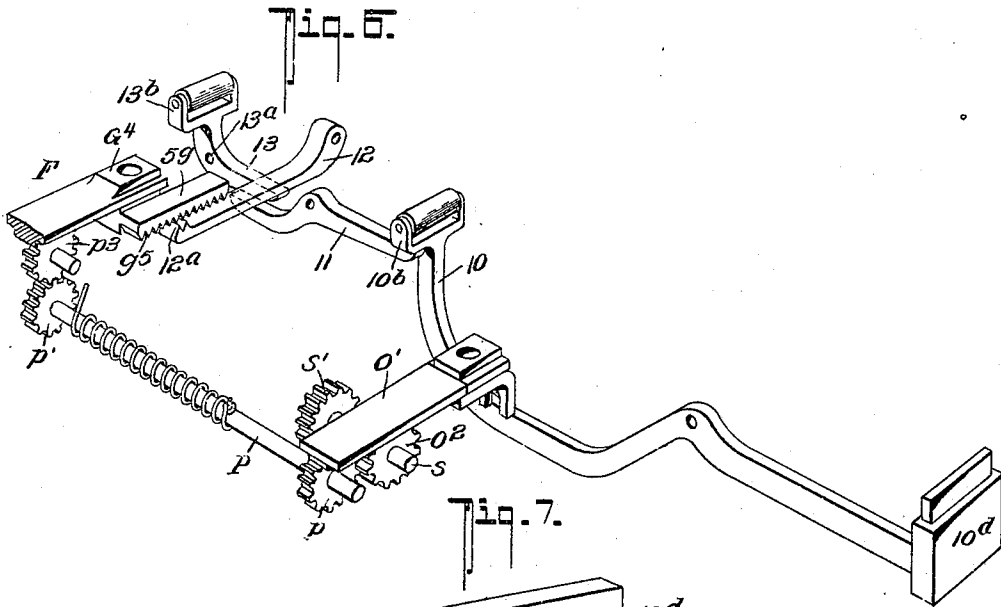
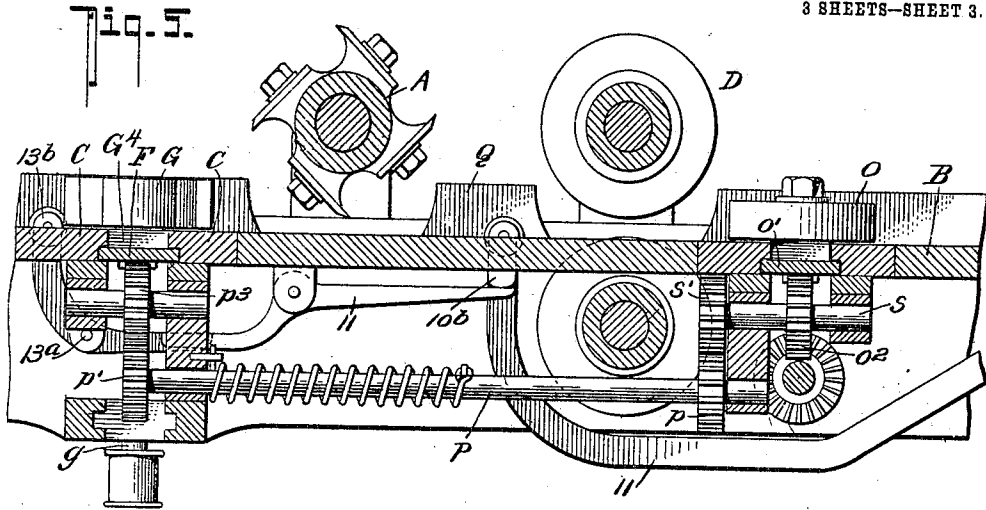
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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PLANING-MACHINE.

No. 830,378.

Specification of Letters Patent

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Application filed March 10, 1905. Serial No. 249,492.

To all whom it may concern:

Be it known that we, GEORGE ANDREWS SMITH and ANDREW CALVIN STRICKLAND, residing at Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Planing-Machines, of which the following is a specification.

This invention, while generally relating to improvements in planing-machines, more particularly relates to certain mechanisms adapted to cooperate with the ordinary types of planing-machines in which the stock to be trimmed and planed is fed by feeding-in rolls between a pair of oppositely-disposed matcher-heads or rotary cutters, one of which is held stationary with respect to its axial adjustment, while the other is adjustably mounted and has means coacting therewith for setting it to suit the width of the material to be dressed.

Ordinarily in dressing lumber—such, for example, as flooring—it is usual to assemble the same after it has been trimmed to the widths desired, each stack consisting of boards of uniform widths, and in dressing the material the adjustable matcher-head or rotary cutter is first set to the desired adjustment to properly operate to dress the boards of predetermined width. For example, if the boards in the stack to be worked up are three-inch-wide stuff the adjustable head or rotary cutter is set to correspond, and when the stuff is, say, three and one-half or four inch wide stuff, &c., the said matcher-head or rotary cutter is adjusted accordingly, the said adjustments being usually effected by a hand-manipulated screw-feed. From practical experience with planing-machines of the general character stated we have found that they do not fill all that is required to effect the desired results in the operation of dressing lumber, particularly for the reason that in the handling of the lumber after it has been trimmed four or five inch stuff is frequently piled up with the stacks of four and one-half and three and one-half and less width stuff, and in running the wide pieces through a needless waste of stock occurs, which when the matcher-heads are set to dress the edges of four-inch stuff and a five-inch board is fed in one-fifth of the said board is dressed off at the edges and wasted. Again,

in the usual forms of planing and matching machines no provision is made for making a close adjustment of the rotary cutters to effect the minimum amount of cutting on the edges of the board, since the adjustments thereof are arbitrary and must be manually set for each of the usual predetermined widths of the stock if the cutting waste is to be held down to the minimum.

Our invention, therefore, generally comprehends, first, a movable guide or "fence" leading to the feeding-in rolls, which is cooperatively connected with the shiftable matcher or cutter head and which is shifted or set by the "stock" or piece of lumber to be dressed and the movement of which acts to simultaneously set the shiftable cutter or matcher head and holds said head to the set position governed by the width of the stock; secondly, in a detent device controlled by the stock after it has been engaged by the feeding-in rolls for controlling the locking of the rotary cutter or matcher head to its automatically-set position, which device also serves to act as a stop for preventing the insertion of a new board or stock-piece until the preceding stock-piece has been properly passed between the rotary cutters or matcher-heads and become disengaged therefrom, this in the combining, with the means for automatically setting the rotary cutter-head and the device for locking it to its "set position," of a trip mechanism also controlled by the stock-piece being dressed, adapted after the said stock-piece has passed from between the edge cutters to effect the release of the shiftable rotary cutter to permit it to automatically assume another adjustment governed by the width of the next stock-piece to be dressed.

In its more complete nature our invention also comprehends the construction of a dial or indicator cooperatively connected with the shiftable cutter-head arranged for facilitating an accurate automatic adjustment thereof relatively to the width of the stock-piece being operated on.

In its more subordinate features our invention comprehends certain details of construction and peculiar combination of parts, all of which will be hereinafter fully explained, and illustrated in the accompanying drawings, in which—

Figure 1 is a plan view showing the general arrangement of a planing and matching machine embodying our invention. Fig. 2 is a longitudinal section on the line 2 2 on Fig. 1. Fig. 3 is a cross-section of the same on the line 3 3 on Fig. 2. Fig. 4 is a similar view on the line 4 4 on Fig. 2. Fig. 5 is a longitudinal section of so much of the complete machine as is necessary to disclose our invention, taken on the line 5 5 on Fig. 1. Fig. 6 is a perspective view which diagrammatically illustrates the correlation of the principal parts of our invention, and Fig. 7 is a detail view hereinafter referred to.

To make the application of our invention readily understood, we have illustrated the same in connection with a well-known type of planing and matching machine, so much of which is shown as is necessary to disclose the cooperative arrangement of the several parts that constitute our invention, the essentials of which are more in the nature of certain attachments adapted, under proper mechanical construction, for connection with any of the well-known forms of planing-machines built on the general plan hereinbefore referred to.

In the several figures of the drawings, details and connection of parts not immediately concerned or required to illustrate the special features referred to have been omitted for clearness in illustration, as the general construction of the machine in respect to the arrangement of its feeding-roll, planing-cylinders, &c., in relation to the bed or platen is similar to other machines of this class and need not be fully detailed here or in the drawings.

Generally referred to, A designates the planing-cylinder that operates on the top of the board or stock-piece, and A³ the lower cylinder for dressing the under side of the board; D, the feeder-in rolls, and K the feeding-out rolls.

In the embodiment of our invention we utilize a slidably-mounted gage member O, which may be the usual side or "starting-in" roll, as in our adjustment of parts it is held free to rotate to effect its usual function, pressing the board against the fixedly-held guide-bar, it differing in our arrangement from its usual form in not having hand-operated means for setting it to its different adjustments. While the member O is shown equipped with means for rotating it, it may be non-rotatable and effect its desired results as a gage-piece.

X designates the usual guide-bar that is removably supported on the bed of the machine with its front edge shaped to fit closely adjacent the roll O. This bar may be simply laid on the bed of the machine without adjustment thereto whatsoever and is grasped by the operator and pushed against the board as it enters the machine to force it

against the guide Q and keep it in proper alinement and with the roll O, the bar X being held against the board by hand until it is in proper alinement to pass through the machine, after which the bar may be withdrawn and simply laid on the bed of the machine. This outward movement of the gage member O we utilize as the means for automatically moving outward to a corresponding degree the shiftable matcher or rotary cutter-head by suitably-arranged mechanism that cooperatively joins the said shiftable gage O with the shiftable head, which mechanism may be constructed for the purpose explained—for example, as shown most clearly in Figs. 5 and 6.

The matcher or cutter heads G G' are of the usual construction for operating on the opposite side edges of the boards and are attached to the spindles *g g'*, mounted in bracket-frames G³ G⁴, and these frames are guided upon the horizontal cross-rails C C of the bed B, the frame G³ being held stationary, it being the one that supports the cutter-head G' in line with the fixedly-held guide Q. The frame G⁴ is slidably mounted on the rails C C to move and carry the cutter G laterally with respect to the fixed guide Q.

The gage member coacts with a rack-faced shank O', that meshes with an idler-pinion *o*² on a short shaft *s*, having a pinion *s'*, that engages a pinion *p* on a rock-shaft P, suitably mounted on the under side of the machine-bed, that extends forwardly and terminates with a pinion *p'*, which engages an idler *p*³, that meshes with a rack member F, integrally connected with the carriage or supporting-bracket G⁴, that carries the cutter G, the several parts just described being so arranged that when the gage-roll O is forced outwardly by the board entering between it and the fixed rail Q slide motion is imparted to the cutter G immediately after the front end of the board passes beyond the gripping-line of the feed-in rolls.

10 designates a lever-rod which has a heel 10^b, that engages a pivoted pawl 11 in contact with a pivoted locking-lever 12, having a beveled locking-tongue 12^a, arranged to be moved into engagement with any one of a series of beveled recesses *g*⁵, formed on one side of the block 5^a, that forms a part of the carriage that supports the shiftable cutter-head before referred to.

It will be noticed the lever 12 is so arranged relatively to the lever 10 and pawl 11 that so soon as the said lever 10 is depressed at its inner end by the front end of the board to be dressed, which occurs immediately after the movement of gage O has properly set the shiftable cutter or matcher head, the carriage with the cutter-head is fixedly held from a further shifting movement in either direction during the passing of the board over the front end of the lever 10. To maintain the

locked position of the cutter-head after the end of the board has passed beyond the inner end of the lever 10 and the latter resumes its normal position and the extreme tail end of the board is yet passing between the dressing-
 5 knives at the edges and top, a supplemental lever 13 is used, which is also controlled by the passing board, it being extended in the longitudinal plane of the bed or table ful-
 10 crumed on the under side thereof, as at 13^a, and provided with a toe-piece 13^b, that projects up through a slot *y* on the platen-bed and normally projects above said bed, as
 15 shown in Fig. 5. This lever 13 extends rearwardly and under the locking-lever 12 and is combined therewith in such manner that while the board is passing out and is holding
 20 the lever 13 depressed the locking-lever 12 will be positively held to its locking position during the entire operation of dressing the top and side edges of the board; but so soon
 25 as the tail end of the board passes beyond the front end of the lever member 13 the said member automatically resumes its normal position, the locking device will automatically
 30 become disengaged from the slidable cutter carrier or frame, which then automatically returns to its innermost position under spring impulse to be again set by the outward move-
 ment of the gage member O in the manner before explained.

To prevent the insertion of a new board while a board is being fed between the rotary cutters and a consequent disarrangement of
 35 the cutter G' and gage member O, an automatically-operating check or stop is located near the outer end of the platen or bed, which stop may be and preferably is a part of the lever 10 and consists of a heel-piece 10^d on the
 40 extreme rear end of the lever, which when the front end of said lever 10 is depressed by the passing board is pressed up through a slot Z in the bed and when projected above the bed it effectively checks the feeding of a new
 45 board in position, and to provide for a proper swing of the lever 10 should a board be very long, greater than the distance between the front and tail end of the lever 10, the heel member 10^d is yieldingly supported on the
 50 said lever, as clearly shown in Fig. 7, which provides for the heel-piece automatically moving up through the slot *z* should the front end of the lever 10 be held depressed by the board before the rear end of the board passes
 55 the heel-piece 10^d.

From the foregoing description, taken in connection with the drawings, it is believed the complete construction, the operation, and the advantages of our invention will be readily apparent to those skilled in the art to which it appertains.

In operation the board is placed on the platen or bed in the usual manner and held up against the fixed guide by the pivoted
 65 gage-rod, and as the board is shoved into the

machine its front end will pass between the fixed guide and the roll O, if the board is of the minimum width. Should the board be wider than the space between the roll O and the rail Q, it is not necessary for the operator
 70 to stop the machine to adjust the roll O, since the front edge of the board will force the roll O outward automatically sufficiently to permit the front end of the board being shoved
 75 into engagement with the feeding-in rolls, which in practice have a powerful grip and serve to positively force the board forward against the top-face-planer device and the edge cutters. Now since the gage or roll O is
 80 automatically moved and as the lateral motion of the said gage or roll is imparted in a uniform manner to the cutter G the said cutter is set to properly trim the edge it engages, the opposing cutter trimming or dressing the other edge, the shifting cutter being fixedly
 85 held to its set position so long as the board is being operated on by the top planers and the edge trimmers. As soon as the board is trimmed on its edges the cutter G together with the roller O are automatically returned
 90 to their normal position through the action of the torsion-spring on the shaft P and the gear connections between the said shaft and the roller O and the cutter G, which are best shown in Fig. 5 of the drawings.

It will be noticed that while the outward
 95 adjustment of the cutter is effected by devices that connect the cutter-carrying frame with the shiftable roll or gage O the said connection is such that it becomes broken so soon
 100 as the locking device engages the carriage or frame in which the cutter G is mounted, thus allowing for a return movement of the roller O while the board is still being engaged by
 105 the cutter G'.

Since the adjustment of the shiftable side
 110 cutter is entirely automatic and governed absolutely by the width of the board fed into the machine, it is manifest that should the stock being worked be three-inch stuff or a
 115 four or five inch piece be run through the parts would automatically adjust themselves so that no waste further than the trimming of the edge of the wider stuff would occur and the full value of the board being worked on
 120 be obtained.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a planing-machine, in combination
 120 with the feeding-in rolls, the stationary guide and the stationary-held matcher or cutter head; of a gage in advance of the feeder-in rolls, shiftable by the stock fed between it and the stationary guide, a shiftable cutter
 125 or matcher head that opposes the stationary matcher or cutter head, connections for joining the gage and the movable cutter or matcher head whereby to cause the two to
 130 move in unison in their outward adjustments,

- a locking device for holding the cutter-head to its automatic adjustments, and a means controlled by the passing stock-piece after it passes the gage for sustaining the lock device to its cutter-head-locking positions and a second means for sustaining the said locking device after the first lock-sustaining means are released as set forth.
2. In a machine of the character described, in combination with the feeder-in rolls, and the fixedly-held matcher or cutter head; an automatically-adjustable matcher or cutter head that opposes the fixedly-held matcher-head, means controlled by the passing board for setting the adjustable cutter-head before the board engages the rotary cutter-heads, a means for positively holding the said adjustable cutter-head locked to its adjusted position, controlled by the passing board, and a second means for positively holding the cutter-head locked from lateral motion after the tail end of the board being operated on passes the feeder-rolls and before it engages the cutter-head.
3. In a machine as described, in combination with the fixed guide, and the fixedly-held matcher-head or rotary cutter; of an automatically-adjustable matcher-head or cutter means for adjusting said cutter controlled by the passing board, a lock device for holding said cutter to its automatically-set positions also set by the passing board, an automatically-actuated stop device for preventing the entrance of a second board until the first board has passed the feeding-in rolls as set forth.
4. The combination with the platen, the feeding-in rolls, the adjustable gage, the adjustable cutter-head, and connections between the head and the gage for causing the two to move in unison; of a lock device for holding the cutter-head to its adjusted positions, a detent for setting said lock device arranged to be actuated by the passing board after its front end leaves the gage, said detent including a member adapted to act as a stop at predetermined times for the purposes described.
5. In a machine of the character described, the combination with the fixedly-held cutter-head and the opposing cutter-head, a laterally-movable bearing in which the last-named cutter-head is mounted, provided with a toothed detent fixedly connected to the said bearing, a laterally-movable gage arranged to be engaged and shifted outwardly by contact therewith, of the front end of the board to be dressed, a laterally-movable bearing for the said gage having a rack portion, connections which include a rotary shaft and a torsion-spring thereon for rotating it to its normal position and gears that couple the said shaft with the rack portions of the two laterally-movable bearings, and a toothed pawl actuated by the passing board adapted to engage the aforesaid toothed detent on the movable bearing that carries the cutter-head, all being arranged substantially as shown and described.
6. In a machine of the character described, the combination with the matcher-heads, and a means for feeding the board through the said heads; of automatic means for preventing the entrance of the second board until after the first board has passed the feeding means, for the purposes specified.
7. In a machine of the character described, the combination with the bed-frame, the transversely-disposed feed-rolls, the stationarily-held matcher or cutter head, a laterally-movable matcher or cutter head and its bearing, and a means controlled by the advancing board for setting the movable cutter to a position determined by the width of the advancing board; of a locking-detent that cooperates with the movable cutter or matcher head bearing and which is normally held to its released position, and a pair of independent lift members that engage the said detent arranged, one in advance of, and the other beyond the said detent, the said lift members being positioned to be engaged by the passing board and when thus engaged, to lift and hold the detent in a locked engagement with the movable cutter-head bearing, substantially as shown and described.
8. In a machine of the character described, the combination with the bed-frame, the feed-rolls, the fixedly-held cutter or matcher head, a laterally-adjustable matcher or cutter head, a locking means, adapted when actuated, to positively lock the movable cutter or matcher head to its laterally-adjustable position, a means actuated by the advancing board for setting the said movable cutter or matcher head, the said locking means being normally at its released or inoperative position; of a means for engaging the detent and moving it to its cutter-head-locking position, said means comprising a pivoted lever, a depressing device therefor, adapted to be engaged by the advancing board, said depressing device being disposed in advance of the rotary cutter or matcher heads and an independent means for throwing the locking device in a locked engagement, said means including a depressing member adapted to be engaged by the passing board located beyond the rotary cutter or matcher heads.
9. In a machine of the character described, in combination with the bed-frame, the transversely-disposed feed-rolls D, the stationarily-held matcher or cutter head, the laterally-movable matcher or cutter head, and a movable bearing in which the last-named cutter-head is mounted, and a means controlled by the advancing board for setting the movable cutter-head to a position determined by the width of the board; of a locking-detent that cooperates with the movable

matcher or cutter head, said detent being normally held to its released or inoperative position and a pair of independently-actuating lift members that engage with the said detent, one of said lift members being arranged in advance of the cutters, the other detent being arranged beyond the said cutters, the two lift members being normally projected above the bed-frame to be engaged by the passing board and when thus engaged, to lift and hold the detent in a locked engagement with the movable cutter-head bearing, substantially as shown and for the purposes described.

10 10. In a machine of the character described, the combination with the bed-frame, the front feed-rolls D and the rear feed-rolls K arranged substantially as shown; of the cutter mechanism disposed between the two sets of feed-rolls D and K, said cutter mechanism comprising a fixedly-held rotatable matcher or cutter head and the laterally-movable rotatable cutter or matcher head and a laterally-movable bearing in which the last-named cutter-head is mounted, a means

for shifting the said movable cutter-head, said means including a laterally-shiftable guide located in advance of the forward feed-roll D and connections that join the said guide with the movable bearing for the lateral cutter-head, a detent for engaging with the movable cutter-head normally held out of engagement therewith, an actuating-lever that engages said detent, said lever being pivoted on the bed-frame and having a detent-depressing member projected above the bed-frame at a point between the feed-rolls D and the cutter mechanism, a second pivoted lever that engages with the detent having the depressing member projected above the bed-frame at a point between the cutter mechanism and the rear feed-rolls K, all being arranged substantially as shown and for the purposes described.

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