

(No Model.)

2 Sheets—Sheet 1.

J. R. THOMAS.

TENONING AND CROSS GAINING MACHINE

No. 302,363.

Patented July 22, 1884.

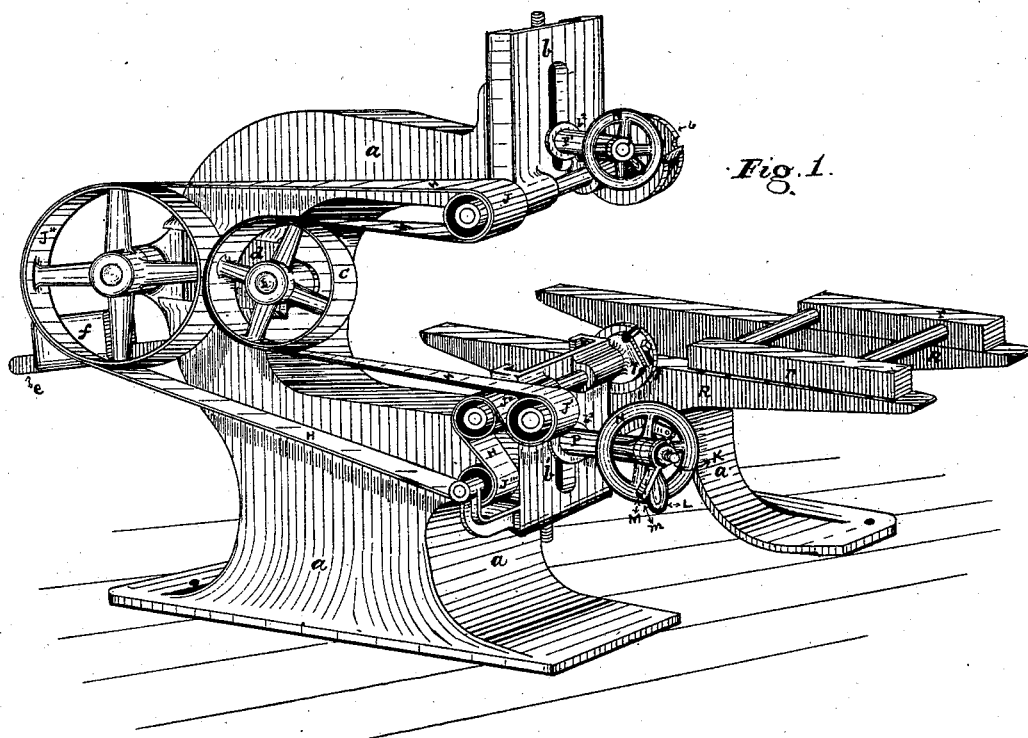


Fig. 1.

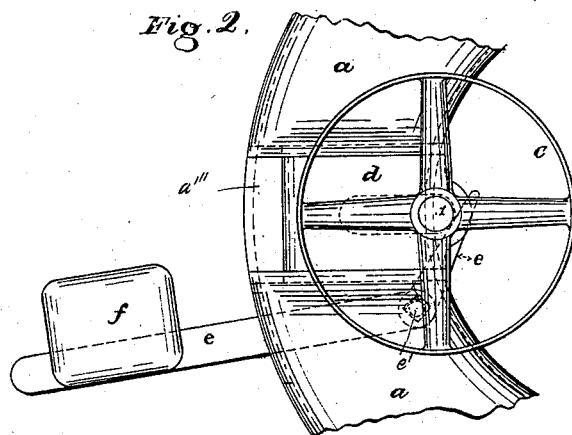


Fig. 2.

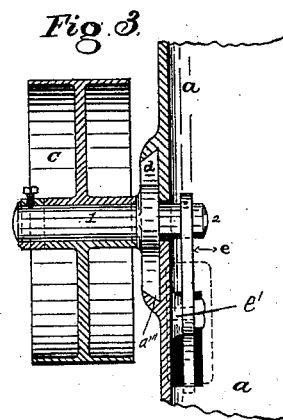


Fig. 3.

WITNESSES

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(No Model.)

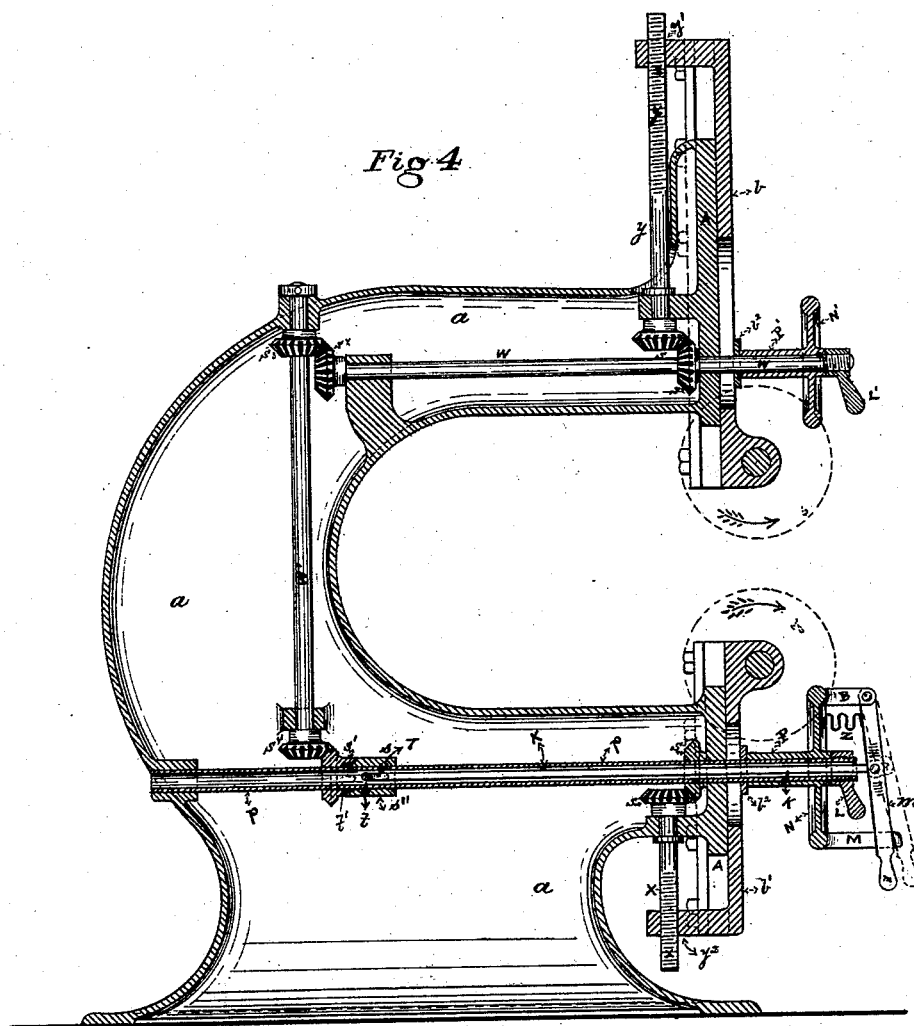
2 Sheets—Sheet 2.

J. R. THOMAS.

TENONING AND CROSS GAINING MACHINE.

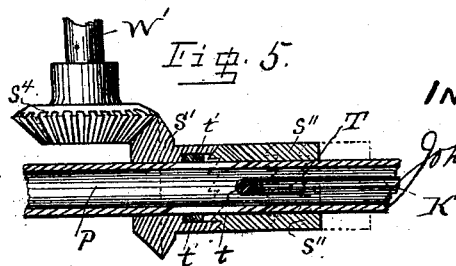
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UNITED STATES PATENT OFFICE.

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TENONING AND CROSS-GAINING MACHINE.

SPECIFICATION forming part of Letters Patent No. 302,363, dated July 22, 1884.

Application filed November 11, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. THOMAS, of Springfield, county of Clark, State of Ohio, have invented a new and useful Improvement in Tenoning and Cross-Gaining Machines, of which the following is a specification.

My invention relates to combined tenoning and cross-gaining machines.

The objects of the invention are, first, to improve the arrangement and operation of the tension or belt-tightener pulley; second, to provide improved means for adjusting the supporting-slides of the cutter-heads; third, to provide improved means for locking the supporting-slides of the cutter-heads.

With these objects in view the invention consists in certain novel features and combinations, which will be fully described in the ensuing specification, and particularly pointed out in the claims at the close thereof.

In the accompanying drawings, Figure 1 is a perspective view of a machine embodying my improvements. Fig. 2 is a side elevation of the belt-tightener or tension-pulley and its operating-lever. Fig. 3 is a vertical section thereof. Fig. 4 is a section taken through the main column of the machine. Fig. 5 is an enlarged view of the clutch mechanism.

The same letters of reference indicate identical parts in all the figures.

The frame or column *a* is formed with a goose-neck, leaving a deep rearwardly-extending gap, as shown, and on the faces of the column, at opposite sides of the gap, are formed ways *A A'*, on which the cutter-head slides *b b'* are mounted. These slides *b b'* are each provided with bearings, in which are seated spindles, on the opposite ends of which are mounted the cutter-heads 6 and 7 and the pulleys *J* and *J''*. The column *a* is provided with suitable bearings for the shafting and for the screws *x* and *y*, which adjust the cutter-head slides *b b'*, and at the side of the column, at the inner end of the gap, is formed a way, *a''*, in which is seated the slide-block *d*. This slide-block *d* carries a spindle, on which is mounted the tightener-pulley *e*, and the inner side of the block carries a stud, 2, which projects through a horizontally-elongated slot in the side of the column. Below said slot is

secured a stud, *e'*, projecting to the interior of the column, and pivoted on this stud is a bent lever, *e*, the short arm of which bears against the stud 2, projecting from the slide-block *d*. The long arm of the lever projects through a slot or opening in the rear of the column to the exterior thereof, and is provided with an adjustable weight, *f*, as shown. Near the front of the column, below the gap, are idlers *J' J''*. The belt *H* is so arranged on the pulleys and idlers that a gap is left therein corresponding to the gap of the column. It will be seen that as the belt *H* passes over the tightener-pulley *e* at a point opposite or nearly opposite the driving-pulley *J'* said pulley *e* is in the best possible position to accommodate itself to change occasioned by the adjustment of the pulleys *J J''* of the cutter-head shafts. In operating machines of this class it becomes necessary at times to work with one cutter-head only, and at such times the cutter-head not in use should be out of the line of travel of the lumber to be operated upon. It is also often required to cut deeper with one cutter-head than with the other, and, again, both cutter-heads are required to make similar cuts. The means for attaining these various adjustments are illustrated in Fig. 4. The column is provided with bearings, in which are seated the horizontal shaft *W*, the vertical shaft *W'*, and the horizontal hollow shaft *p*. The shafts *W* and *p* project through the front of the column and are screw-threaded on their projecting ends. The shaft *W* is provided with a beveled pinion, *S*, meshing with a similar pinion, *s*, fixed on the lower end of the screw-shaft *y*, by which the slide of the upper cutter-head is adjusted vertically, and carries at its inner end a similar pinion, *s^x*, meshing with a pinion, *s³*, on the upper end of the vertical shaft *W'*, and on the lower end of this shaft is another beveled pinion, *s⁴*. The hollow shaft is provided with a beveled pinion, *s⁵*, meshing with a similar pinion, *s*, fixed to the upper end of the screw-shaft *x*, which adjusts the slide of the lower cutter-head. The bevel-pinions so far described are rigidly fixed to their respective shafts.

Mounted to rotate on the hollow shaft *p* in such a position as to mesh with the pinion *s⁴*

of the shaft W' is a pinion, s'. The hub of the pinion is recessed to receive a collar, t, (shown in black lines, Fig. 4,) which is fixed to the shaft p and prevents said pinion from moving in the longitudinal direction of the shaft, and in the overhanging end of the hub are formed clutch-teeth.

Mounted to slide within the shaft p is a rod, K, to the inner end of which is secured a cross-pin, t, the ends of which project through longitudinal slots T, formed in the shaft p, and into a clutch-block, s'', the end of which is provided with clutch-teeth adapted to engage with the clutch-teeth on the hub of the beveled pinion s'. It will be seen from this description that the clutch-block s'' is adapted to slide longitudinally on the shaft p, but, owing to its connection with the rod K, cannot rotate thereon, and that in consequence of this arrangement, when the clutch-block s'' is in engagement with the hub of the pinion s', the latter will be locked to the shaft and rotated thereby, and the movement be communicated through shafts W' and W and their pinions to the screw-shaft y.

To the projecting end of the horizontal shaft W is feathered the elongated hub P' of the hand-wheel N', so that it may be moved longitudinally, but cannot be rotated thereon.

Between the hub P' and the slide b of the upper cutter-head is seated a washer, b², and upon this outer threaded end of the shaft is a nut, L', which may be tightened up, so as to clamp the slide b between the washer b² and the face of the column, so that it cannot move. A hand-wheel, N, is similarly secured to the projecting end of the lower horizontal shaft, p, and secured to this lower hand-wheel, N, is a stud, B, to the outer end of which is pivoted a lever, m.

Projecting from the hand-wheel at a point opposite the stud B is a catch, M, which engages the lever m, and to said lever, at a point opposite the axial center of the shaft p, is secured the outer end of the rod K. A spring, Z, is interposed between the lever m and the hand-wheel, the stress of which is exerted to force the lever away from the hand-wheel. By this means the shifting-lever m is held tightly in engagement with the catch M, and when disengaged from said catch is forced away therefrom into the position shown in dotted lines.

Should it be desired to adjust both cutter-heads simultaneously by one or the other of the hand-wheels, the shifting-lever m is forced into engagement with the catch M, and this movement causes the clutch-block s'' to mesh with the hub of pinion s'. In this position of the clutch the shafts p, W', and W are connected, so that the movement of one of the hand-wheels will cause a similar movement of the shafts to cause the rotation of the adjusting-screws y and x. When it is desired to adjust only one cutter-head, the clutch s' s'' is thrown out of engagement by means of the rod K, thus permitting the horizontal shafts W and p to be rotated independently of each

other. When the proper adjustment of the cutter-heads is obtained, the cutter-head slides are securely locked by means of the nuts L L', hubs P P', and washers b², as heretofore stated.

I do not confine myself strictly to the exact construction hereinbefore described, as it is obvious that many modifications might be made without departing from the spirit of my invention. For instance, instead of mounting the pinion s to rotate on the shaft, and forming a clutch member upon its hub to engage with the clutch s'', the hub of said pinion might be connected to the shifting-rod and slid longitudinally on the shaft, to throw teeth of the pinion into or out of gear with the pinion on shaft W', thus dispensing with the clutch s''; and, again, instead of interposing the washers b² between the hubs of the hand-wheels N N' and the cutter-head slides, said hubs might be formed with a flange, between which and the face of the column said slides might be clamped.

Having thus described my invention, what I claim is—

1. In a machine of the character described, the combination, substantially as before set forth, of the cutter-head pulleys and the driving-pulley and automatic tightener-pulley mounted at points to one side of and substantially at right angles to a line passing through the axial centers of said cutter-head pulleys.

2. The combination, with the driving and cutting-head pulleys, of the automatic belt-tightener, consisting, substantially as before set forth, of the block d, provided with a pulley and a stud, and adapted to slide in ways formed in the column, and the bent weighted lever pivoted to the column and bearing with its short arm against the stud of the slide-block.

3. In a gaining-machine of the character described, the combination, with the upper and lower adjusting-screws, the upper and lower horizontal shafts, each provided with a hand-wheel, and the vertical shaft, all connected by bevel-gears, as described, of the single shifting-rod adapted to connect or disconnect the screw-shafts for simultaneous or independent adjustment, substantially as described.

4. In a machine of the character described, the combination, substantially as before set forth, of the upper and lower screw-shafts, the upper and lower horizontal shafts, connected, respectively, with said screw-shafts by fixed bevel-gears, the vertical shaft connected to the upper horizontal shaft by fixed bevel-gears, and to the lower hollow horizontal shaft by shiftable bevel-gears, and the shifting-rod mounted to slide within said lower or hollow horizontal shaft, and connected at its inner end to said shiftable gear.

5. The combination, with the cutter-head slides and the shafts and pinions, arranged as described, for adjusting said slides, of the hollow shaft, the hand-wheel mounted thereon, the shifting-lever pivoted to the hand-wheel,

the shifting-rod sliding within the hollow shaft and pivoted to and actuated by the shifting-lever, and the clutch-pinion mounted on the hollow shaft and adapted to be adjusted longitudinally thereon by the shifting-rod, substantially as before set forth.

6. The combination, with the cutter-head slides and the shafts and pinions, arranged as described, for adjusting said slides, of the hollow shaft, the hand-wheel mounted thereon, the shifting-lever pivoted to the hand-wheel, the shifting-rod sliding within the hollow shaft and pivoted to be actuated by the shifting-lever, and the clutch-pinion mounted on the hollow shaft and adapted to be adjusted longitudinally thereon by the shifting-rod, and means for holding the shifting-lever when the

clutch is in engagement, substantially as before set forth.

7. The combination, substantially as before set forth, of the cutter-head slide, the screw-shaft for adjusting said slide, the horizontal shaft connected to the screw-shaft by bevel-gears, the hand-wheel feathered to said horizontal shaft, and the nut for clamping said slide between the hub of the hand-wheel and the face of the column.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN R. THOMAS.

Witnesses:

CHARLES L. SUESSMAN,
ALBERT N. SPENCER.