July 28, 1936. J. E. BOICE 2,049,044

WOODWORKING MACHINE

Filed Nov. 16, 1933

Fig. 4

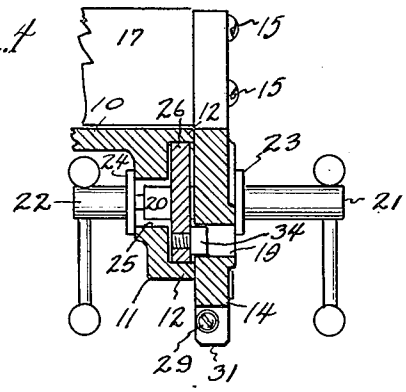


Fig. 3

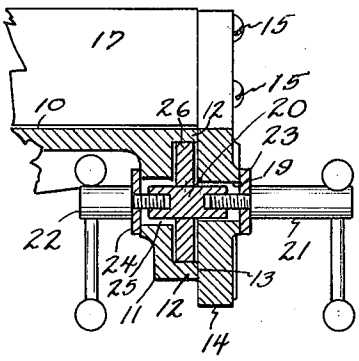
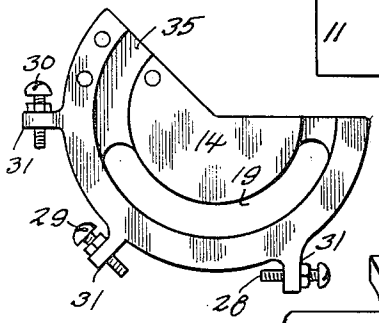


Fig. 5



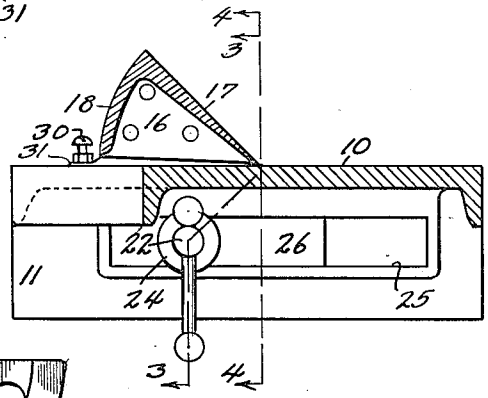


Fig. 2

Fig. 1

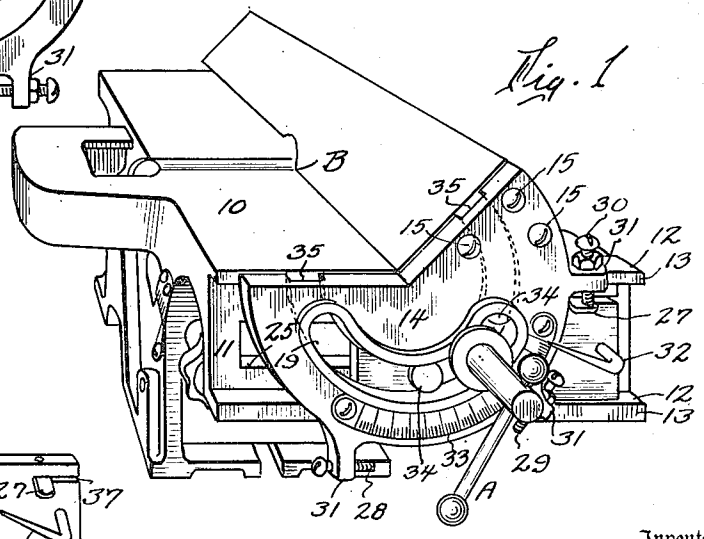
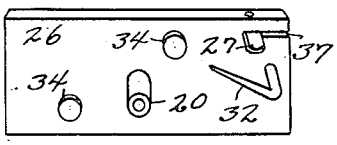


Fig. 6



Inventor

By John E. Boice

Lynn H. Latta Attorney

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2,049,044

WOODWORKING MACHINE

John E. Boice, Toledo, Ohio

Application November 16, 1933, Serial No. 698,278

13 Claims. (Cl. 144—253)

This invention relates to mechanism for adjustably mounting and gauging the position of the fence of a jointer or like machine wherein the fence is mounted for tilting movement around its longitudinal axis and for translatory movement transversely of said axis. It embodies an arrangement wherein the fence is carried by a sector secured to one of its ends, the sector in turn being mounted for direct engagement with a track on the end of a jointer bed for orienting the longitudinal axis of the fence; for swinging movement around the axis of its lower edge to allow it to be tilted to different angular positions; and for sliding movement parallel to the upper face of the bed and at right angles to said longitudinal axis.

One object is to provide for direct engagement of the sector with a track formed integrally with the bed so as to secure maximum accuracy of longitudinal orientation. To this end, it is contemplated that no intermediate bracket shall intervene between the sector and the bed for mounting of the fence, whereas in prior structures of this type, such an intervening bracket, mounted on the bed for transverse sliding movement, and in turn carrying the fence for tilting movement around its longitudinal axis, has been employed. A guide block, carrying an index finger for cooperating with a scale on the sector and carrying a stop for cooperating with positioning lugs on the sector for determining the main positions of adjustment, is floatingly mounted so as not to interfere with the aforesaid direct engagement between the sector and bed.

A further object is to provide, in such a structure, an arrangement wherein an index pointer and retractible stop element are carried by a floating guide block, which is pivotally connected to the sector so as to travel laterally with the fence in fixed relation to the axis thereof, and slidingly connected to the bed so that the positions of the pointer and stop relative to the plane of the bed may remain constant.

With these and other objects in view, my invention consists in the construction, combination, and arrangement of the various parts of my invention, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawing, in which:

Fig. 1 is a perspective view of a jointer embodying the invention,

Fig. 2 is a transverse sectional view of the same looking toward the mounted end of the fence,

Fig. 3 is a longitudinal sectional view through the mounting taken on the line 3—3 of Fig. 2,

Fig. 4 is a view taken on the line 4—4 of Fig. 2,

Fig. 5 is a view of the inner side of the sector, and

Fig. 6 is a perspective view of the guide block.

The jointer bed is indicated generally at 10. At one end it is formed with a track 11 defined between rails 12, the outer faces of which are machined in a common plane. The sector 14 is secured by means of three screws 15 to the end wall 16 of the fence 17. The back side of the fence is formed with reinforcing flange 18. The inner face of the sector is machined to a smooth flat finish for engagement with the faces 13 of the rails 12.

An arcuate slot 19, concentric with the axis of tilting movement of the fence (the lower edge of the fence) allows the sector to rotate relative to the clamping device A which passes through the sector. The clamping device A comprises a tie link 20, into the respective ends of which are threaded the handscrews 21 and 22. The handscrew 21 has a collar 23 which engages the sector 14, and the handscrew 22 has a similar collar 24 which engages the rear side of the track 11. A horizontal slot 25 is provided in the track 11 to allow sliding movement of the handscrew 22.

Tightening of the handscrew 21 shortens the distance between the collars 23, 24, thereby urging the sector 14 and track 11 into engagement with each other. The engaging contact being between the machined faces of the sector and the rails 13, the fence 17 will be accurately aligned with the longitudinal axis of the bed 10, irrespective of the angular position of the fence or the position of lateral adjustment. The tension thus set up between the handscrews 21, 22 is transmitted through the tie link 20.

The guide block 26 is rigidly secured to the tie link 20, the latter being passed through the block and secured by a pinned close fit. The guide block serves to hold the tie link against rotation. It also serves to support a hinged stop 27, which may be moved into position to engage set screws 28, 29, 30 in lugs 31 formed on the arcuate periphery of the sector 14. Such engagement determines the three most used positions of angular adjustment of the fence relative to the bed 10, i. e., 45, 90, and 135 degrees inclination. The set screws make it possible to initially set these positions to a high degree of accuracy, and to correct for errors that may arise later. The guide block also serves as a support for an index finger 32

which cooperates with a scale 33 on the outer face of the sector 14, for determining intermediate positions of angular adjustment of the fence. A pair of buttons 34 secured to the block 26, are positioned to slide in an arcuate groove 35 in the inner face of the sector 14, registering with the slot 19. These buttons, in conjunction with that portion of the tie link 20 which projects into the slot 19, cause the block 26 to maintain a constant position relative to the axis of tilting movement of the fence, to insure accuracy in the coaction of the scale and pointer. The buttons also provide radial support for the fence while allowing it to tilt about its axis, the near region of the fence being supported in this manner with a slight clearance above the bed so as to avoid binding when tilting occurs. At the point B the fence rides against the table.

The block 26 is of less thickness than the rails 13 so as not to interfere with the engagement between the sector and the rails 13. This absence of interference holds true even though the block may be shifted from side to side so as to selectively engage either the sector 14 or the track 11. In the former case, the handscrew 21 is tightened while the handscrew 22 remains loose. This will bring the block 26 into clamping engagement with the inner face of the sector 14, and will secure the fence against tilting movement while allowing it to slide freely laterally. In the latter case, the handscrew 22 is tightened while the handscrew 21 remains loose, thus drawing the block 26 into engagement with the track 11 and securing the fence against lateral sliding movement while allowing it to tilt freely. These two additional functions of the guide block are possible without interference with the engagement between sector and rails 13, for the reason that in either case the loose handscrew must be tightened in order to complete the engagement between sector and rails. The value of these two additional functions lies in the fact that under some circumstances it may be desirable to frequently adjust the inclination of the fence without disturbing its lateral position while in other cases it may be desirable to adjust the lateral position without disturbing the inclination. Normally the block 26 functions neither to secure the fence against tilting nor against lateral movement, both of these functions being performed in all cases where the two handscrews are tightened, by the engagement between rails and sector.

It may be noted, then, that the block 26 is floatingly mounted between the sector and the track 11, functioning normally simply as a support for the tie link 20, the index finger 32, and the stop 27, associated with the sector in such a manner as to maintain a fixed position relative to the axis of tilting movement, slidable laterally with the fence and sector, and holding the tie link against rotation.

A much greater degree of accuracy in the longitudinal aligning of the fence may be secured by the direct engagement between the sector and the rails which are formed integrally with the jointer bed.

The stop 27 may be swung into the slot 37 in which it is mounted, so as to allow the central lug 31 to be swung by it in moving the fence across the ninety degree position.

This combination of a rotatable sector and lug carrying member, provided with three lugs engageable with a swinging stop which may be retracted to allow the central lug to pass it, does not form a part of the present invention, except in combination with other features thereof, as will be pointed out in my claims.

In explanation of the term "radial" as applied to the support which is provided by the buttons 34, it may be noted that the buttons not only support the weight of the adjacent end of the fence, but maintain the sector centered with respect to the axis of tilting which is fixed relative to the block 26 so that the relation of the pointer 32 to the scale 33 remains very accurate. To state it in a different manner, the buttons prevent the sector from moving lengthwise of the block 26.

I claim as my invention:

1. In a jointer, a bed formed at one end with a track, a fence provided at one end with a sector depending into swinging and sliding engagement with the outer face region of said track, the track having a straight slot and the sector having an arcuate slot concentric with its axis of tilting movement, and clamping means including two members to respectively engage the outer side of the sector and the rear side of the track and a tie link for drawing said members together for clamping the sector and track in engagement with each other, said tie link extending through said slots.

2. In a jointer, a bed formed at one end with an integral depending track formed with a vertical face on its outer side, a fence provided at one end with a depending sector having a plane inner face swingingly engageable with said vertical face and slidable thereagainst transversely to the axis of swinging movement, and clamping means engageable respectively with the rear side of the track and with the outer side of the sector for drawing said sector and track into clamping engagement with each other, whereby to lock the fence against tilting or sliding movement and to secure the fence in parallelism with the longitudinal axis of the bed.

3. In a jointer, a bed formed at one end with a depending fixed track formed with a vertical plane outer face, a fence provided at one end with a depending sector having a plane inner face perpendicular to the longitudinal axis of the fence, said inner face being swingingly engageable with said outer face and slidable thereagainst transversely of said longitudinal axis, and means for drawing said sector and track into clamping engagement with each other whereby to lock the fence against both sliding and tilting movement and to secure it in a predetermined position of angularity relative to the bed axis.

4. In a jointer, a bed formed at one end with a track, a fence formed at one end with a sector depending into swinging and sliding engagement with outer face portions of said track that are perpendicular to the bed, a guide block slidable in said track and attached to the sector, so as to slide therewith, but held against rotation by the track, a scale on the sector, an index finger carried by said guide block, and cooperating with the scale, and means for drawing said sector and track into clamping engagement with each other to lock the fence against either tilting or sliding movement, and to secure the fence in longitudinal parallelism with the longitudinal axis of the bed.

5. In a jointer, a bed formed at one end with a track having outer face portions lying in a plane perpendicular to the upper face of the bed, a fence formed with a sector depending into swinging and sliding engagement with said face

portions, a guide block slidable in said track and thereby held against rotation, a scale on the sector, an index finger carried by the guide block and cooperating with said scale, and means for drawing the sector and track into clamping engagement with each other, comprising a tie link carried by the guide block and handscrews extended through and engaging the sector and track respectively and threaded into the respective ends of said tie link.

6. In a jointer, a bed formed at one end with a fixed track having outer face portions lying in a plane perpendicular to the upper face of the bed, a fence formed at one end with a sector depending into swinging and sliding engagement with said face portions, releasable means for causing said sector to engage said outer face portions for securing the fence in a given position in which it is locked against both sliding and tilting movements, and for positioning said fence, when in any such given position, in parallelism with the longitudinal axis of the bed, a guide block slidable in the track and attached to the sector so as to slide therewith but held against rotation by the track, lugs projecting from the periphery of said sector, and a retractible stop mounted on the block for movement into or out of the path of movement of said lugs.

7. In a jointer, a bed formed at one end with a fixed track having outer face portions lying in a plane perpendicular to the upper face of the bed, a fence formed at one end with a sector depending into swinging and sliding engagement with said face portions, releasable means for causing said sector to engage said outer face portions for securing the fence in a given position in which it is locked against both sliding and tilting movements, and for positioning said fence, when in any such given position, in parallelism with the longitudinal axis of the bed, a guide block mounted in the track for sliding movement in said track, the guide block being connected to the sector to furnish vertical support for that end of the fence which is connected to the sector, an intermediate region of the fence resting against the bed.

8. In a jointer, a bed formed at one end with a depending track having outer faces located in a plane transverse to its longitudinal axis, a fence formed at one end with a sector depending into swinging and sliding engagement with said outer faces of said track, clamping means extending through said sector and through the track, including means for engaging the front side of the sector and means for engaging the rear side of the track for locking the sector in engagement with said faces, and an element on the clamping means selectively operable to engage either the forward side of the track or the rear side of the sector, whereby to lock the fence against sliding movement while allowing tilting movement, or to lock the fence against tilting movement while allowing sliding movement, as the case may be.

9. In a jointer, a bed formed at one end with a depending track including spaced horizontal rails separated by a horizontal slot and provided with outer faces positioned in a common perpendicular plane, a fence formed at one end with a sector having an inner face perpendicular to its axis of tilting movement and in swinging and sliding engagement with said outer faces, a guide block slidable in said track, vertically supported by the lower rail and connected to said sector for radially supporting the adjacent end of the fence, said guide block being arcuately slidable relative to the sector, and being of less thickness than the depth of the track so as to allow full engagement between the sector and said outer faces, and clamping means carried by said block, extending through said slot, and engaging the rear side of the track and the outer face of the sector respectively for clamping the sector into engagement with said outer faces and thereby supporting the fence in any of its various positions of tilted adjustment and orienting the fence in longitudinal parallelism with the bed.

10. In a jointer, a bed formed at one end with a track, a fence formed at one end with a sector depending into swinging and sliding engagement with outer face portions of said track that are perpendicular to the bed, a guide block slidable in said track and attached to the sector so as to slide therewith, but held against rotation by the track, a scale and an index finger, one secured to the sector and the other carried by the guide block, cooperating with each other to indicate the angle of inclination of the fence, and means for drawing said sector and track into clamping engagement with each other to lock the fence against both tilting and sliding movements and to secure the fence in longitudinal parallelism with the longitudinal axis of the bed.

11. The combination with a machine table, of an angularly adjustable gage movable along said table, and means for releasably retaining said gage against movement along said table and for clamping said gage in angularly adjusted position, said means including a pair of rotatable members one of which effects the retention of said gage against movement along said table and the other of which effects the clamping of said gage in angularly adjusted position, said rotatable members being arranged in substantially coaxial relation.

12. In a jointer, a table formed at one end with horizontal ways and a slot extending longitudinally of said ways, said table having spaced ribs forming said slot and presenting shoulders behind said slot, said ways having machined outer faces arranged in a common vertical plane, a fence positioned horizontally above said table, means extending downwardly from one end of the fence and slidably engaged against said vertical faces to position the fence in parallelism to the longitudinal axis of the table in any of a plurality of laterally separated positions, said means including a guide block slidably mounted in said ways and a sector secured to the fence and pivoted to said block to allow the fence to tilt around an axis perpendicular to said faces, said sector having an arcuate slot a portion of which registers with the slot in the table, a scale and an index finger, one secured to the sector and the other carried by the guide block, cooperating with each other to indicate the angle of inclination of the fence; and independently operable clamping devices coaxially associated together in an operating unit extending through both of said slots and through the guide block and carried by the latter on a horizontal axis at a fixed distance from the axis of tilting movement, one of said devices having means engaging said shoulders to clamp the block against sliding movement and the other having means engaging the front side of the sector to clamp the latter against tilting movement.

13. In a jointer, a table formed at one end with horizontal ways and a slot extending longitudinally of said ways, said table having spaced

ribs forming said slot and presenting shoulders behind said slot, said ways having machined outer faces arranged in a common vertical plane, a fence positioned horizontally above said table, means extending downwardly from one end of the fence and slidably engaged against said vertical faces to position the fence in parallelism to the longitudinal axis of the table in any of a plurality of laterally separated positions, said means including a guide block slidably mounted in said ways and a sector secured to the fence and pivoted to said block to allow the fence to tilt around an axis perpendicular to said faces, said sector having an arcuate slot a portion of which registers with the slot in the table; and independently operable clamping devices coaxially associated together in an operating unit extending through both of said slots and through the guide block and carried by the latter on a horizontal axis at a fixed distance from the axis of tilting movement, one of said devices having means engaging said shoulder to clamp the block against sliding movement and the other having means engaging the front side of the sector to clamp the latter against tilting movement.

JOHN E. BOICE.