(No Model.)

3 Sheets—Sheet 1.

A. B. CAMERON.

GUIDE FOR WOOD CHANNELING MACHINES.

No. 436,966. Patented Sept. 23, 1890.

Fig. 1.

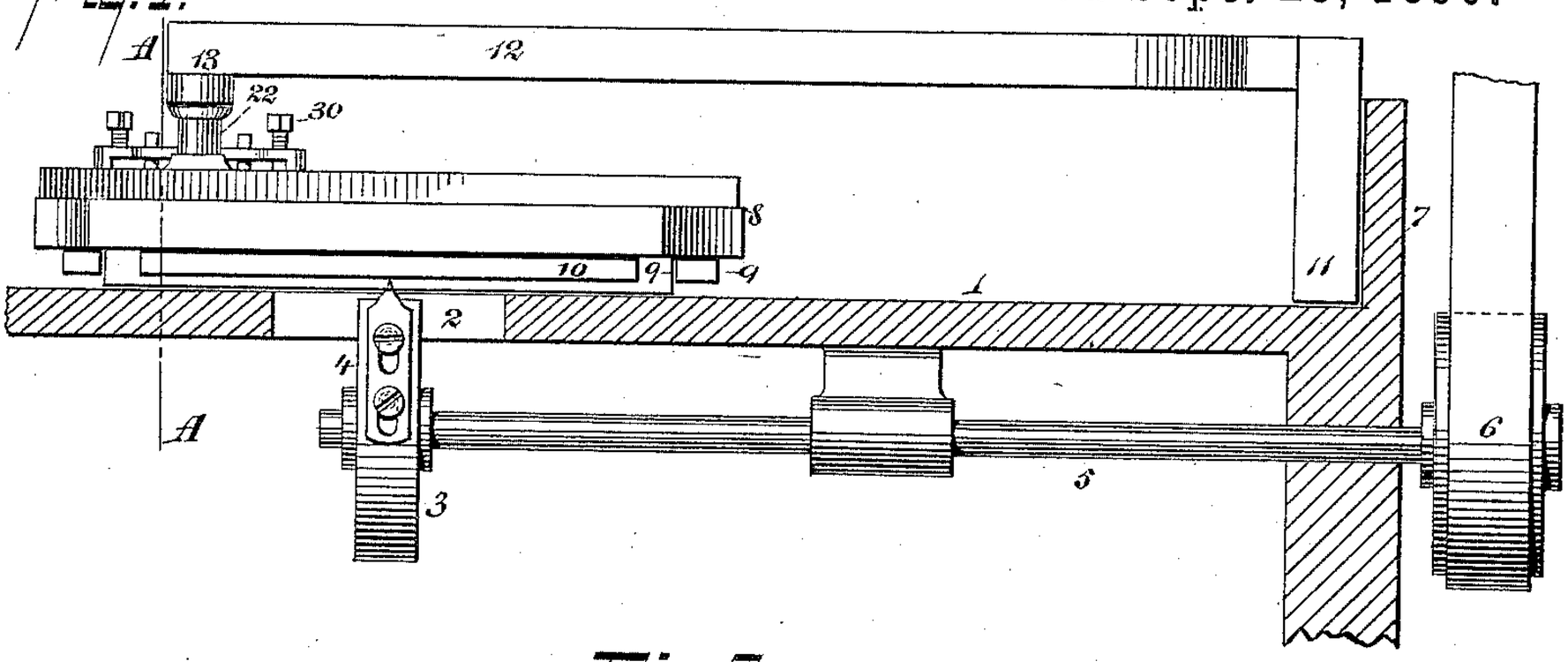


Fig. 2.

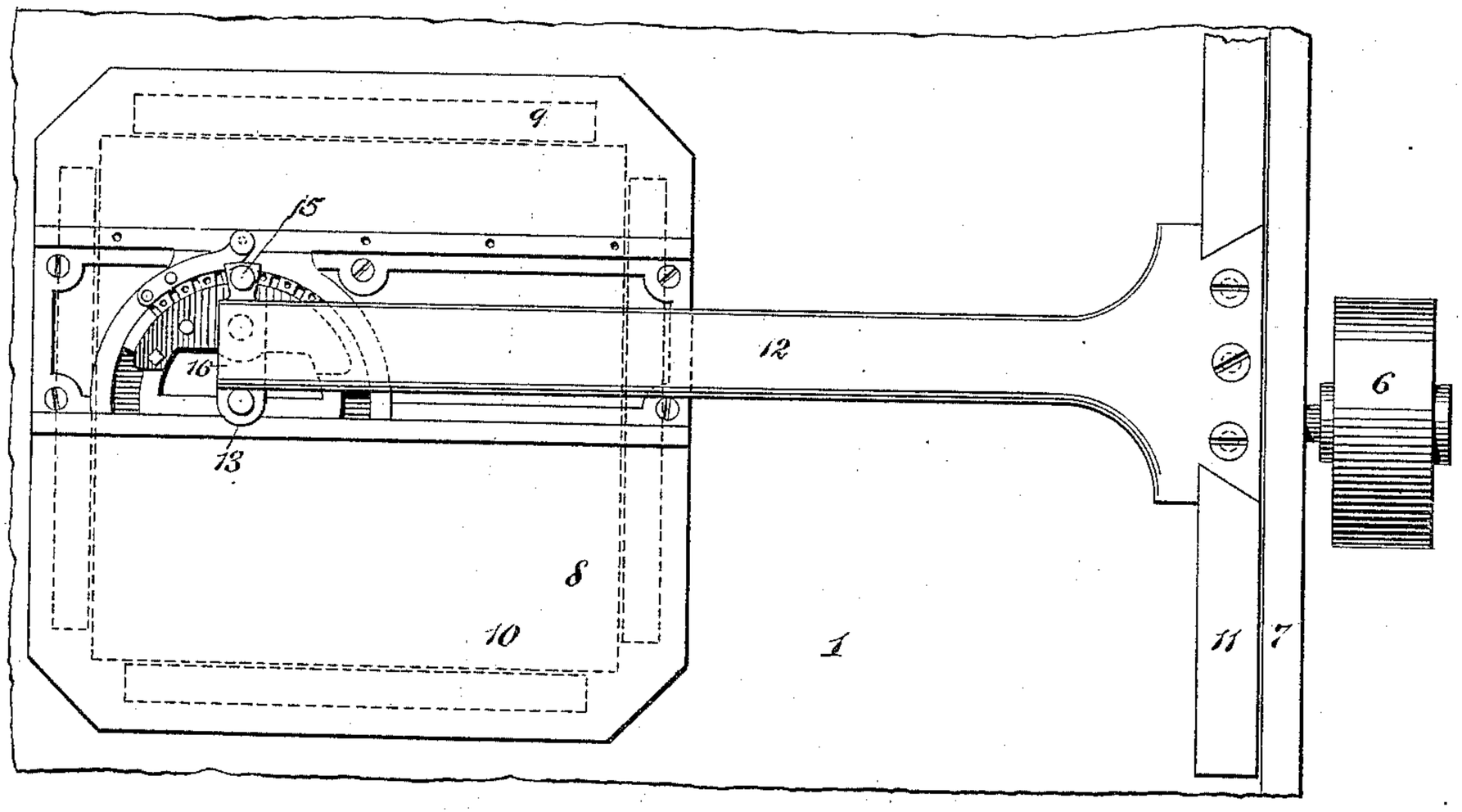
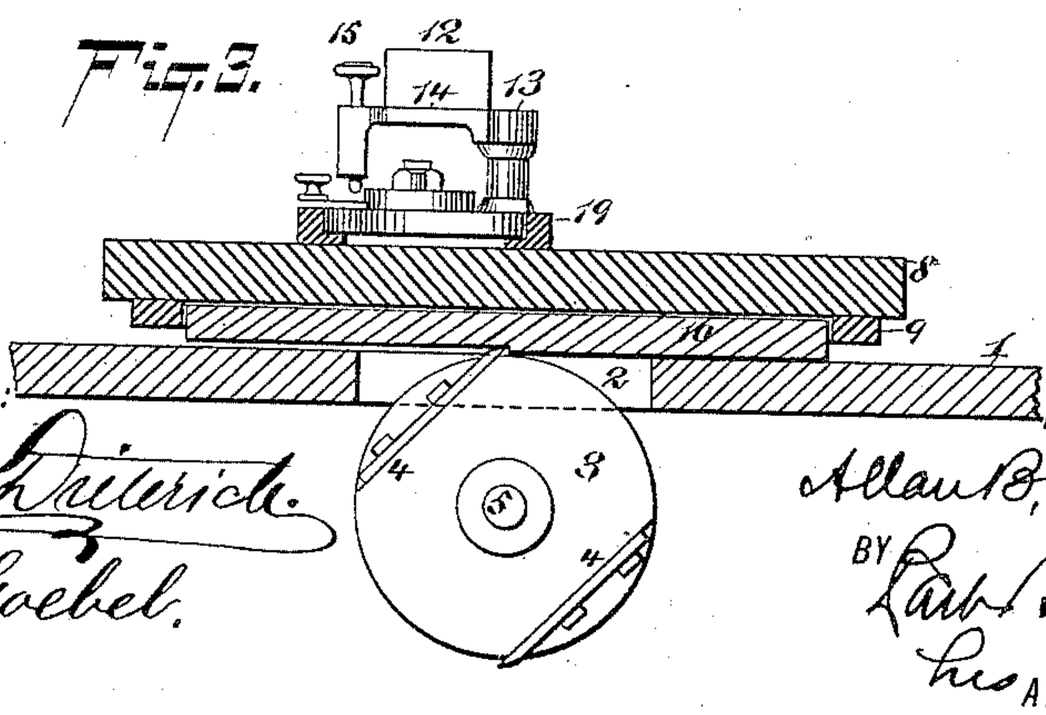


Fig. 3.



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(No Model.) 3 Sheets—Sheet 2.

A. B. CAMERON.

GUIDE FOR WOOD CHANNELING MACHINES.

No. 436,966. Patented Sept. 23, 1890.

Fig. 4

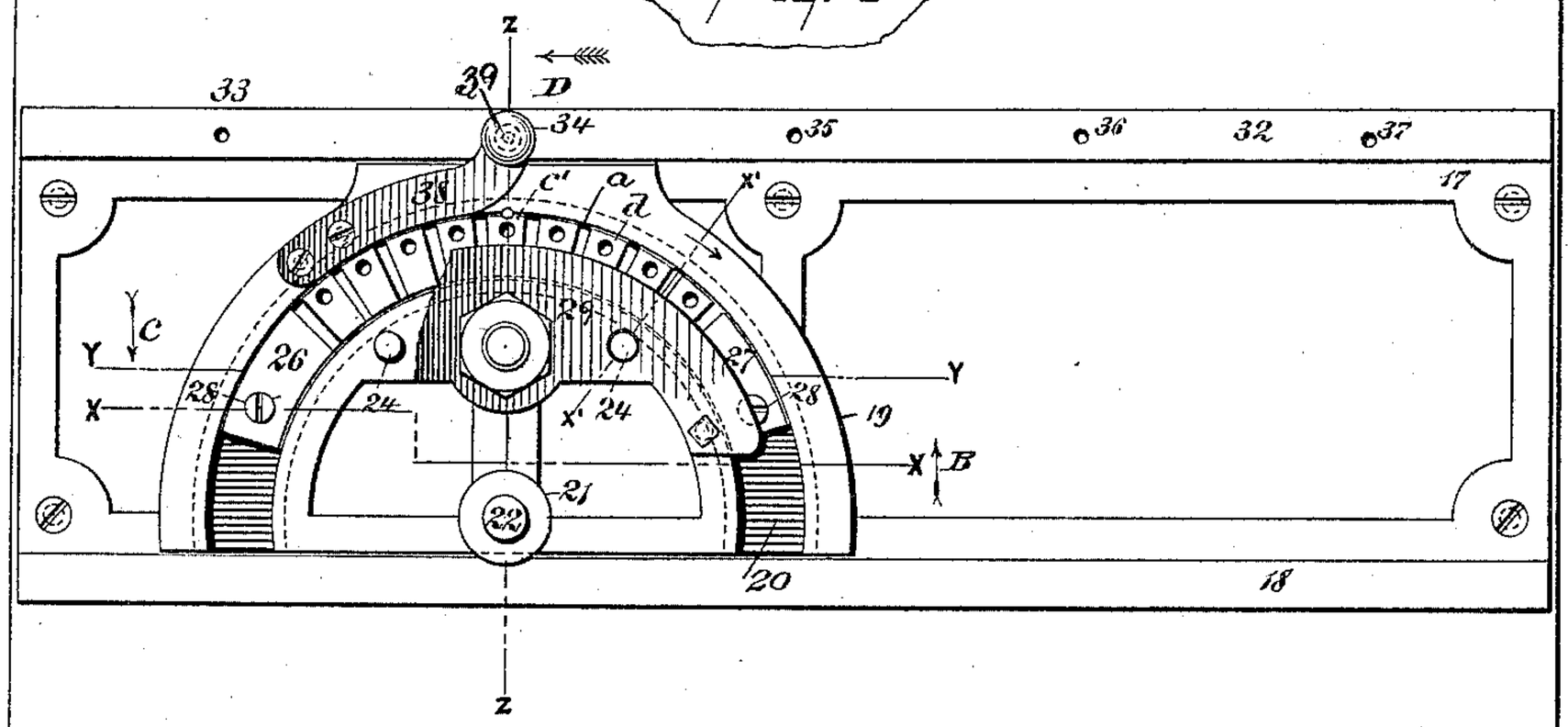


Fig. 5.

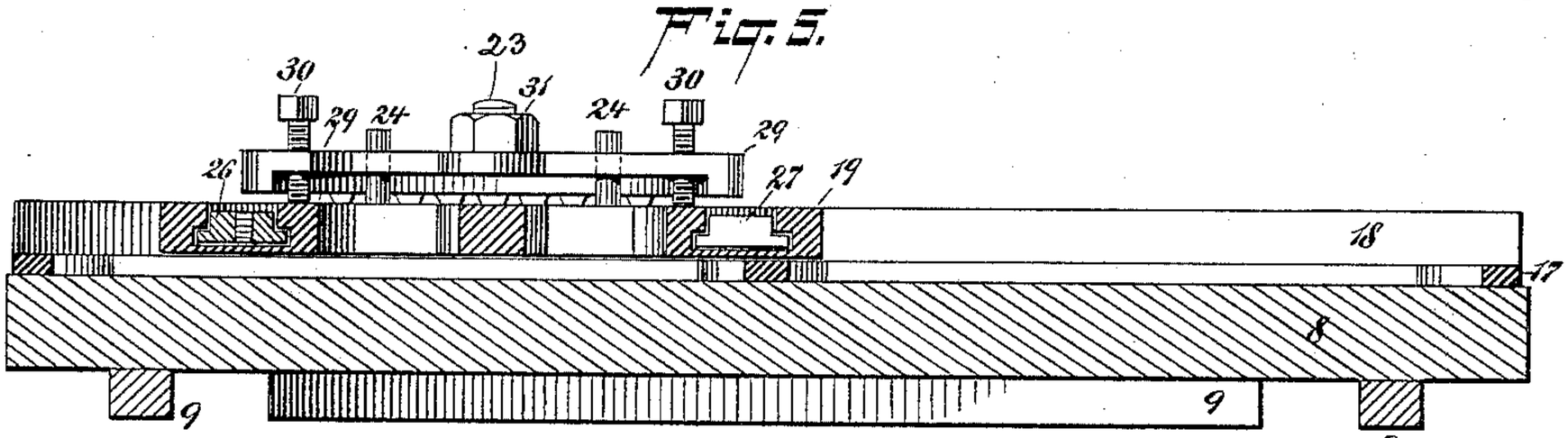


Fig. 6.

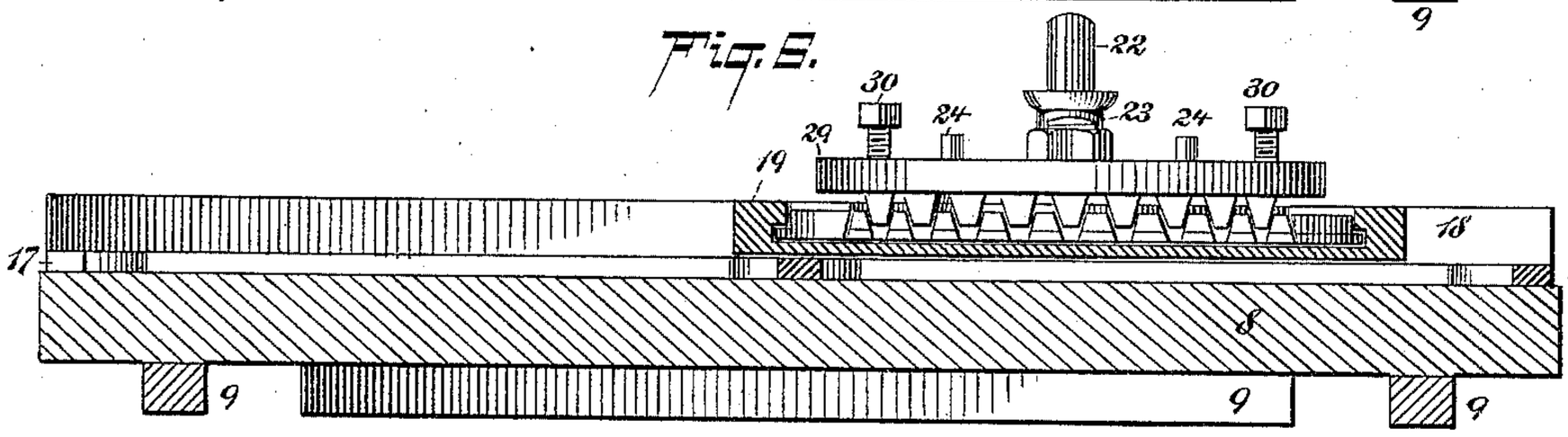
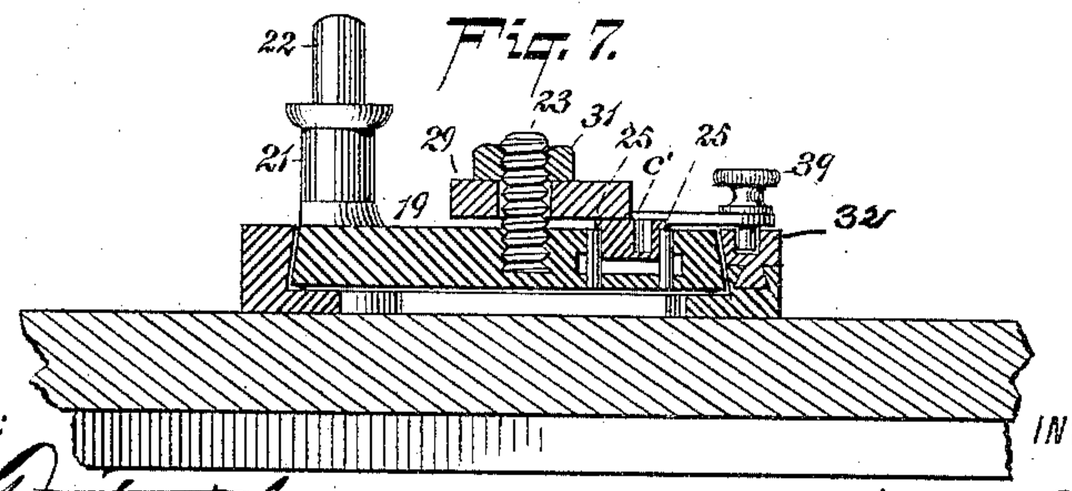


Fig. 7.



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3 Sheets—Sheet 3.

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GUIDE FOR WOOD CHANNELING MACHINES.

No. 436,966. Patented Sept. 23, 1890.

Fig. 8.

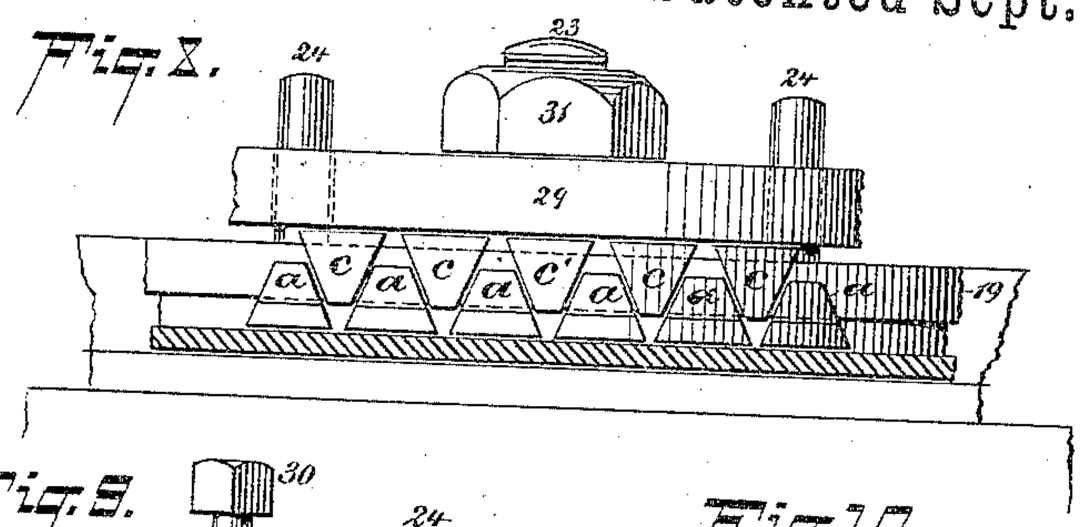


Fig. 9.

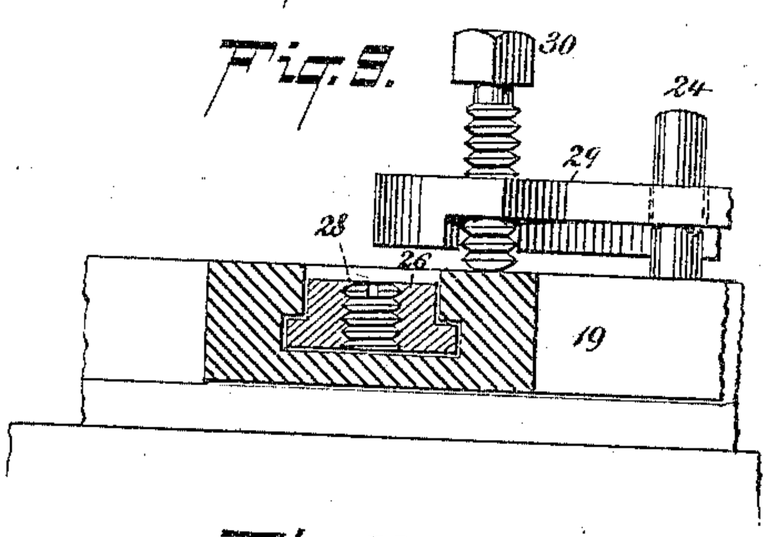


Fig. 10.

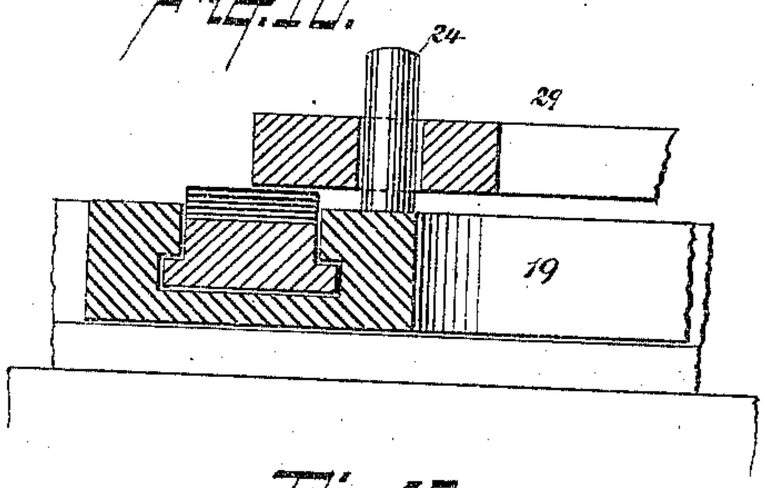


Fig. 11.

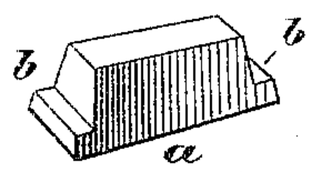


Fig. 12.

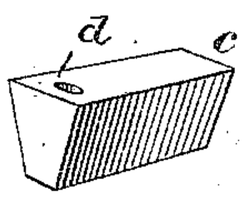
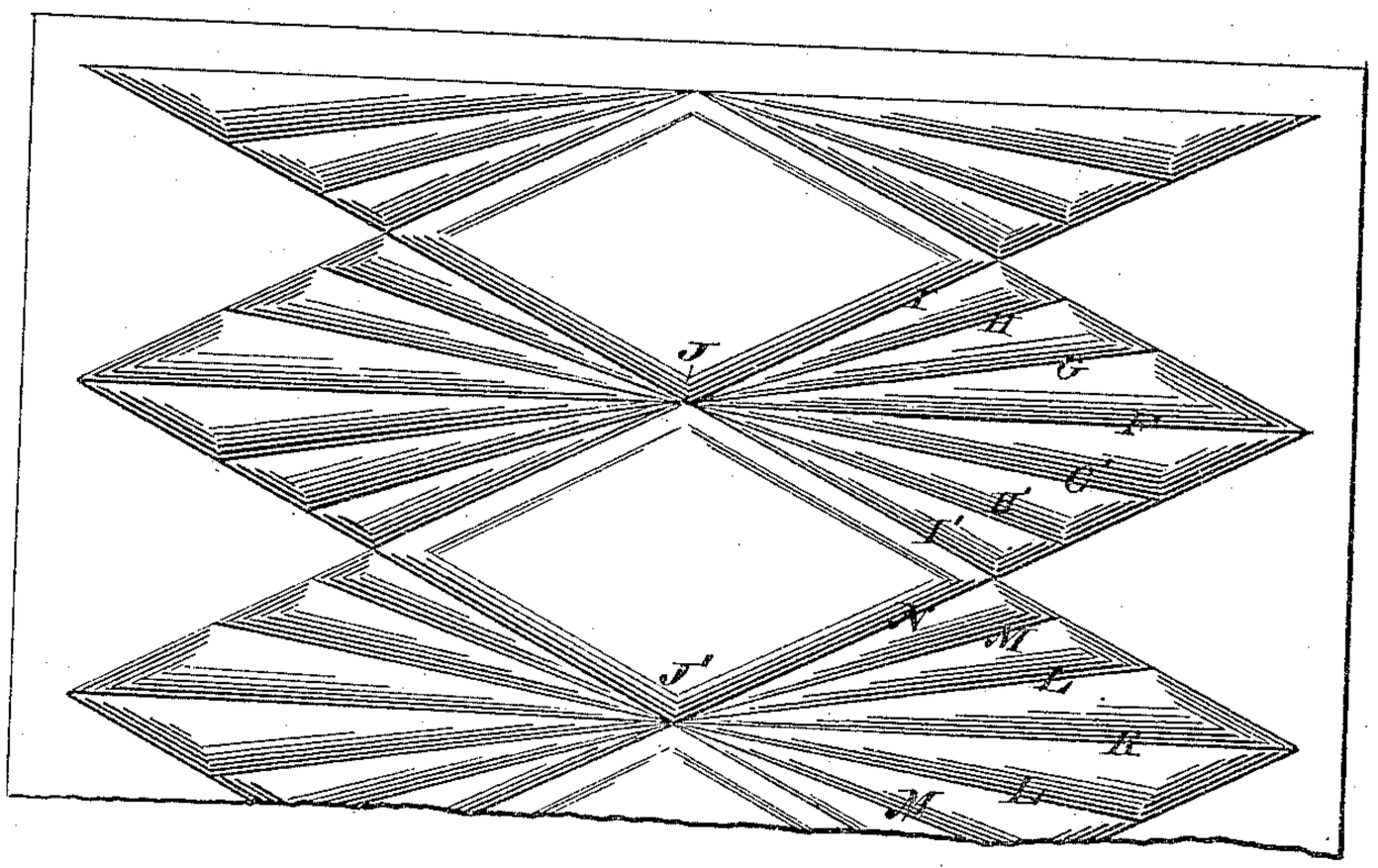


Fig. 13.



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GUIDE FOR WOOD-CHANNELING MACHINES.

SPECIFICATION forming part of Letters Patent No. 436,966, dated September 23, 1890.

Application filed March 19, 1890. Serial No. 344,446. (No model.)

To all whom it may concern:

Be it known that I, ALLAN B. CAMERON, of Williamsport, Lycoming county, Pennsylvania, have invented a new and useful Improvement in Guides for Wood-Channeling Machines, of which the following is a specification.

My invention relates to machinery for producing, by means of rotary cutters, grooves or channels upon wood at an angle to the grain thereof; and it consists in the construction and arrangement of the guide hereinafter described, whereby an ornamental pattern of channels radiating from a center may be produced and repeated indefinitely upon the wood without special manipulative skill on the part of the machine-attendant.

In the accompanying drawings, Figure 1 is a side elevation of my apparatus, showing the supporting-table in vertical section. Fig. 2 is a plan view. Fig. 3 is a section on the line A A of Fig. 1. Fig. 4 is a plan view of my guide, separately showing the details on a larger scale than in Fig. 2. Fig. 5 is a section on the line X X of Fig. 4, taken in the direction of the arrow B. Fig. 6 is a section on the line Y Y of Fig. 4, showing the wedges in side elevation and taken in the direction of the arrow C, Fig. 4. Fig. 7 is a section on the line Z Z of Fig. 4, taken in the direction of the arrow D. Fig. 8 is an enlarged section on the line Y Y of Fig. 4, shown in detail, and, on a larger scale, the arrangement of wedges. Fig. 9 is a partial section also on the line X X of Fig. 4, showing in enlarged detail the elevating-screw for the wedge-plate and adjacent parts. Fig. 10 is a section on the line X′ X′ of Fig. 4. Fig. 11 shows one of the movable blocks separately; Fig. 12, one of the wedges separately, and Fig. 13 represents a wooden panel having on its surface an ornamental configuration as an illustration of the result produced by the use of my guide.

Referring first to Fig. 1, 1 is the table of a wood-channeling machine. In said table is an opening 2, and operating in said opening is a rotary cutter-head 3, provided with suitably-formed knives 4. The cutter-head 3 is supported on a shaft 5, which is journaled in supports on the table 1, and is rotated by the belt and pulley 6. On the rear edges of the table 1 is a ledge 7.

8 is the work-plate. To the under side of this plate is secured between the clamping-bars 9, Fig. 2, (dotted lines) the panel 10, on the under surface of which the ornamental relief configuration is to be produced. The work-plate is placed on the table 1 with the face of the attached panel 10 downward. The plate is then to be moved over the cutter 3 in such a way that the cutter will produce the desired configuration upon the surface of the panel. It is the object of my improved guide to enable the workman to move the plate, and hence the panel, so that an ornamental configuration, broadly described as produced by a number of channels radiating from a common center, may be accurately made without calling for any manipulative skill on the part of the attendant further than is necessary to slide the panel over the cutter.

11 is a bar, which rests upon the table 1 and slides thereon, being guided by the ledge 7. To said bar is secured an arm 12. At the end of said arm is a short metal bar 14, having at one end a socket 13, and at the other end a vertically-sliding pivot-pin 15.

Upon the upper side of the work-plate 8 is attached a metal plate 17, provided with longitudinal flanges 18. The inner edges of the flanges 18 are inclined outwardly, so that the plate 8 forms a dovetail way or slide, in which is received the semicircular plate 19. The plate 19 may be moved freely longitudinally on the plate 8, but is retained thereon by the dovetail flanges 18.

In the semicircular plate 19 is formed a semicircular channel 20; also, upon the semicircular plate 19 is a pillar 21, from which rises a pin 22. There is also upon said plate a screw-bolt 23 and two pins 24. Within the semicircular channel 20 are arranged a number of similar wedge-shaped blocks *a*, one of which is shown separately in Fig. 11. These blocks *a*, Fig. 8, are provided with end projections *b*, Fig. 11, which projections pass under the overhanging edges of the channel 20. The blocks therefore are free to slide in said channel and are retained therein by said overhanging edges.

Interposed between the blocks *a* are wedges

c, Fig. 8. All of these wedges are loose, except the middle wedge *c'*, Figs. 4 and 7. Pins 25, Fig. 7, are received in grooves in the edges of wedge *c'*, and also in the edge of the channel 20. These pins allow of vertical movement of the wedge *c'*, but prevent its lateral displacement. As will be seen from Fig. 8, the wedges *c* and wedge-blocks *a* alternate in the semicircular channel; also, in said channel and at each end of the series of wedges and blocks are two sliding pieces 26 27. These pieces have projecting edges, which extend under the overhanging sides of the channel 20; but they are free to slide in said channel. In each piece 26 27 there is a screw 28, Fig. 9, which when turned down forces the edges of the sliding piece against the sides of the channel, and so clamps said sliding piece immovably in place.

29 is a metal plate provided with apertures to receive the screw-bolt 23 and the fixed pins 24. Passing through said plate 29 and bearing upon the semicircular plate 19 are two set-screws 30. The plate 29 is confined in place by the nut 31, which is put upon the bolt 23.

Returning now to the fixed plate 17, upon one flange 18 thereof is made a dovetail groove to receive a bar 32. In this bar are a number of holes 33 34 35 36 37, spaced at uniform intervals apart. The flange to which this bar 32 is connected by the dovetail joint is lower than the other flange 18 of the plate 8, so that the upper surface of the bar 32 and of the opposite flange 18 are level.

Attached to the semicircular plate 19 by means of a leaf-spring 38 is a pin 39, which enters the holes 33, &c., in the bar 32, as shown in Fig. 7.

I will now describe the operation of the apparatus above detailed. The panel, being adjusted in the work-plate, is placed on the table face downward and above the rotary cutter 3. The pin 22 is then inserted in the socket 13 on the end of arm 12. It will be apparent that inasmuch as the channel 20 in the plate 19 is a circular arc, having the pin 22 as a center, the bar 14 at the end of arm 12 is a radius of that circle. Hence the pin 15, when the work-plate is turned on the pin 22 as a center, will describe a circular path coinciding with the channel 20, and the end of pin 15 will pass over the series of wedges *c* placed in said channel. In each wedge *c* there is a hole *d*, into which the pin 15 may be inserted, and when the bar is so inserted the work-plate will then be held at a determinate angle depending upon the distance in arc of the hole in which the pin 15 is inserted from the line Z Z of Fig. 4, this line passing through the center pivot 22 and the middle wedge *c'*, and hence being at right angles to the direction of the arm 12. Suppose, therefore, it were desired simply to cut a channel in the panel in a direction at right angles to the line of said arm 12, the parts will appear as shown in the plan view, Fig. 2, the pin 15 then entering the hole in the central wedge *c'*. The attendant would then grasp the arm 12 in his hand and would slide the work-plate and bar over the table, the bar 11 resting against and being guided by ledge 7, thus bringing the panel over the cutter, which would produce a channel in the surface of that panel in the direction stated—such, for example, as the channel marked F in Fig. 13. Suppose now that it were desired to make a second channel standing at an angle to the channel F, and radiating from one end of the channel F as a center, such, for instance, as the channel G or G', Fig. 13. The attendant would then lift the pin 15 out of the hole in the center wedge *c'*, and turning the work-plate on the pin 22 as a pivot, would bring the aperture in another wedge *c*, located at one side or the other of the central wedge, and then insert the pin 15 into the hole in the wedge thus brought into place. The work-plate is thus set at a new angle with reference to the cutter, so that when the plate and arm 12 are moved over the cutter again in the manner already described, the channel G or G' made by the cutter will stand at an angle to the channel F. In this way, by turning the work-plate over greater angles and fastening it in place by inserting the pin 15 in the apertures of the wedges *c*, other channels—H H' I I', for example—may be produced radiating from a common center J, which center on the panel coincides with the position of the pin 22 on the opposite side of the work-plate.

Now, supposing, having made a set of radiating channels starting from the center J, it is desired to make a new series of radiating channels starting from a new center, as J', Fig. 13. The pin 39 is then lifted out of the aperture 34, in which it is shown in Fig. 4 as inserted in the bar 32, and the semicircular plate 19 is slid along in the plate 8 until the spring-pin 39 can enter a new hole in the bar 32, as, for example, the hole 35. Clearly, then, the position of the pivot-pin 22 will be displaced for a distance equal to the distance between the holes 34 and 35, and a series of channels K L M, Fig. 13, may be cut, radiating from the new center or point J'; and this operation may be repeated from as many new centers as there are apertures in bar 32. The result is the production of a pattern such as shown in Fig. 13, which pattern may be modified in various ways.

If it be desired to increase or decrease the number of centers from which the channels radiate, then for the bar 32 another bar may be substituted containing more or less adjusting-holes 33 34, &c.

Referring now to Fig. 13, it will be obvious that the distance between the extremities of the channels I I' or width of the diamond-shaped figure produced is equal to the distance between the centers J J', from which said channels radiate, and also, as already stated, the distance between the centers J J' equals the distance between adjacent holes 34 35—for example, on bar 32; also, from Fig.

13 it will be seen that from the point J seven channels—namely, I H G F G′ H′ I′—radiate, being separated by equal angles; and it will also be obvious that to produce these channels the work-plate must be adjusted on its center-pin 22 seven times. To hold the plate in adjustment, seven wedges *c* must be arranged, so that the pin 15 in being transferred from the hole in one wedge to the hole in the next, will pass over equal angles; or, in other words, starting from the central fixed wedge *c′* three wedges *c* must be adjusted on each side thereof within an interval measured at right angles to the line Z Z equal to one-half the distance J J′, or one-half the distance between the apertures 34 35, for example; or, to put it in another way, the distance between the holes in the extreme wedges of the series of seven must equal the distance between adjacent apertures in the bar 32. Reference to Fig. 4 will show that this arrangement of wedges is there represented.

The adjustment of the wedges and blocks is done by hand, the nut 31 on the bolt 23 being loosened and the set-screws 28 being slackened, so that the sliding pieces 26 and 27 may slide freely in the channel 20. The blocks *a* are then pushed together or moved apart until the holes in the extreme wedges *c* of the series of seven are a trifle inside their final position. Then the nut 31 is screwed down, so that the presser-plate 29 is brought down upon the upper faces of all the wedges *c*, and this plate in its descent causes all the wedges to separate by an equal increment until the distance between the holes in the said extreme wedges is brought equal to the distance between adjacent apertures, as 34 35, in the bar 32. The screws 28 in the sliders 26 27 are then tightened, so that further lateral motion of the wedges and blocks is prevented and the set-screws 30 are turned down, thus forcing the presser-plate tightly against the nut 31, and so clamping it in place. All parts thus become rigidly secured in their adjusted position, and the attendant has nothing further to do but to adjust the pin 15 successively in the holes in the wedges *c*, thus turning the work-plate over the proper angles and to move the plate over the cutter to produce on panels the pattern shown in Fig. 13, which may be repeated indefinitely.

Suppose, however, it were desired to produce nine channels radiating from the point J instead of seven, the interval between the ends of the extreme channels being kept the same. The various screws would be loosened, and instead of seven wedges adjusted in the given space nine wedges would be arranged therein and the parts secured in position as before; and similarly if a less number of channels—say 5—were desired in the same space, then a corresponding number of wedges would be arranged in the manner described in the same interval. It will be seen, therefore, that the distance between the holes 34 35 36, &c., on the bar 32 governs the distance between the extreme channels of the radiating series, and that the arrangement of the wedges governs the number of channels forming said series. If the distance between the extreme channels or between the centers from which each series of channels radiates is desired to be less or greater than the intervals between the holes in the bar 32, then another and similar bar is substituted for the bar 32, having the apertures therein differently spaced.

The advantage of this device is that it allows of relief patterns, highly ornamental in character and often of much intricacy, to be produced upon the surface of wood without requiring any manipulative skill from the attendant who controls the material. The designer, for example, may adjust the apparatus to produce a desired pattern, and then deliver it to the machine attendant, who simply places the pin 15 in the holes in the wedges *c*, successively, and moves the work over the cutter.

I claim—

1. In combination with the arm 12, provided with the pin 15, the work-plate 8, pivoted to said arm and having a series of apertures to receive the said pin 15 disposed in a circular arc struck from said pivot as a center.

2. In combination with the arm 12, having at its extremity the transverse bar 14, provided at one end with the pin 15, and a pivot-socket 13 at its other end, the work-plate 8, having a pin 22, constructed to enter said pivot-socket, and a series of apertures to receive said pin 15, disposed in a circular arc struck from said pin 22 as a center.

3. In combination with the arm 12, provided with the pin 15, the work-plate 8, pivoted to said arm, and a series of blocks, each having an aperture in its upper face to receive said pin secured and adjustable upon said work-plate, the said blocks being disposed with their apertures in the line of a circular arc struck from said pivot as a center.

4. In combination with the arm 12, provided with the pin 15, the work-plate 8, and the guide-plate 19, adjustable upon said work-plate and pivoted to said arm, the said guide-plate 19 having a series of apertures to receive the said pin 15, disposed in a circular arc struck from said pivot as a center.

5. In combination with the arm 12, provided with the pin 15, the work-plate 8, the guide-plate 19, adjustable upon said work-plate, pivoted to said arm, and provided with the arc-shaped channel 20, struck from said pivot as a center, and a series of blocks, each having an aperture in its upper surface to receive said pin 15, adjustable in said channel.

6. In combination with the arm 12, carrying the pin 15, the work-plate 8, the fixed ways or flanged plate 17 thereon, and the guide-plate 19, sliding in said ways, a pivot-connection between said arm and said guide-plate, and a series of apertures to receive said pin 15, disposed in a circular arc struck from said pivot as a center.

7. In combination with the arm 12, carrying the pin 15, the work-plate 8, the fixed flanged plate 17 thereon, having on the upper face of one flange a series of apertures 33 34, &c., the guide-plate 19, sliding in said fixed plate and having a pin 39, adapted to enter said apertures, a pivot-connection between said arm and said guide-plate, and in said guide-plate a series of apertures to receive said pin 15, disposed in a circular arc struck from said pivot as a center.

8. The combination of the work-plate 8, guide-plate thereon, having the channel 20, and the wedges *c*, provided with apertures in their upper faces, and the blocks *a*, disposed in said channel.

9. The combination of the work-plate 8, guide-plate 19 thereon, having the channel 20, the vertically but not laterally, movable central wedge *c'*, and the loose wedges *c*, having apertures in their upper faces, and blocks *a*, disposed and alternating in said channel.

10. The combination of the work-plate 8, guide-plate 19 thereon, having the channel 20, a series of wedge-blocks *a*, disposed in said channel and provided with projections *b*, entering recesses in the edges of said channel and alternating with said blocks, and the loose wedges *c*, having apertures in their upper faces.

11. The combination of the work-plate 8, guide-plate 19 thereon, having the channel 20, a series of wedge-blocks *a*, disposed in said channel, a series of wedges *c*, alternating with said wedge-blocks and having apertures in their upper faces and the sliding pieces 26 27, and means for clamping said pieces 26 27 in fixed position.

12. The combination of the work-plate 8, guide-plate 19 thereon, having the channel 20, a series of wedge-blocks *a*, disposed in said channel, a series of wedges *c*, alternating with said wedge-blocks and having apertures in their upper faces, and the presser-plate 29, supported on said guide-plate 19 and bearing upon said wedges *c*.

13. The combination of the work-plate 8, guide-plate 19 thereon, having the channel 20, a series of wedge-blocks *a*, disposed in said channel, a series of wedges *c*, alternating with said wedge-blocks and having apertures in their upper faces, the presser-plate 29, supported on said guide-plate 19, and means for vertically adjusting said presser-plate toward or away from said guide-plate.

14. The combination of the work-plate 8, guide-plate 19 thereon, having the channel 20, and the threaded fixed pin or bolt 23, a series of wedge-blocks *a*, disposed in said channel, a series of wedges *c*, alternating with said wedge-blocks and having apertures in their upper faces, the presser-plate 29, supported on said guide-plate 19, and receiving said bolt 23, and the nut 31 on said bolt above said presser-plate.

15. The combination of the work-plate 8, guide-plate 19 thereon, having the channel 20, and the threaded fixed pin or bolt 23, a series of wedge-blocks *a*, disposed in said channel, a series of wedges *c*, alternating with said wedge-blocks and having apertures in their upper faces, the presser-plate 29, receiving said bolt 23, the nut 31 on said bolt 23, above said presser-plate, and the set-screws 30, passing through said plate 29 and bearing on said guide-plate 19.

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