April 9, 1929. J. E. ECKERSLEY 1,708,442

MULTIPLE GROOVER MACHINE

Filed Oct. 13, 1927 5 Sheets-Sheet 1

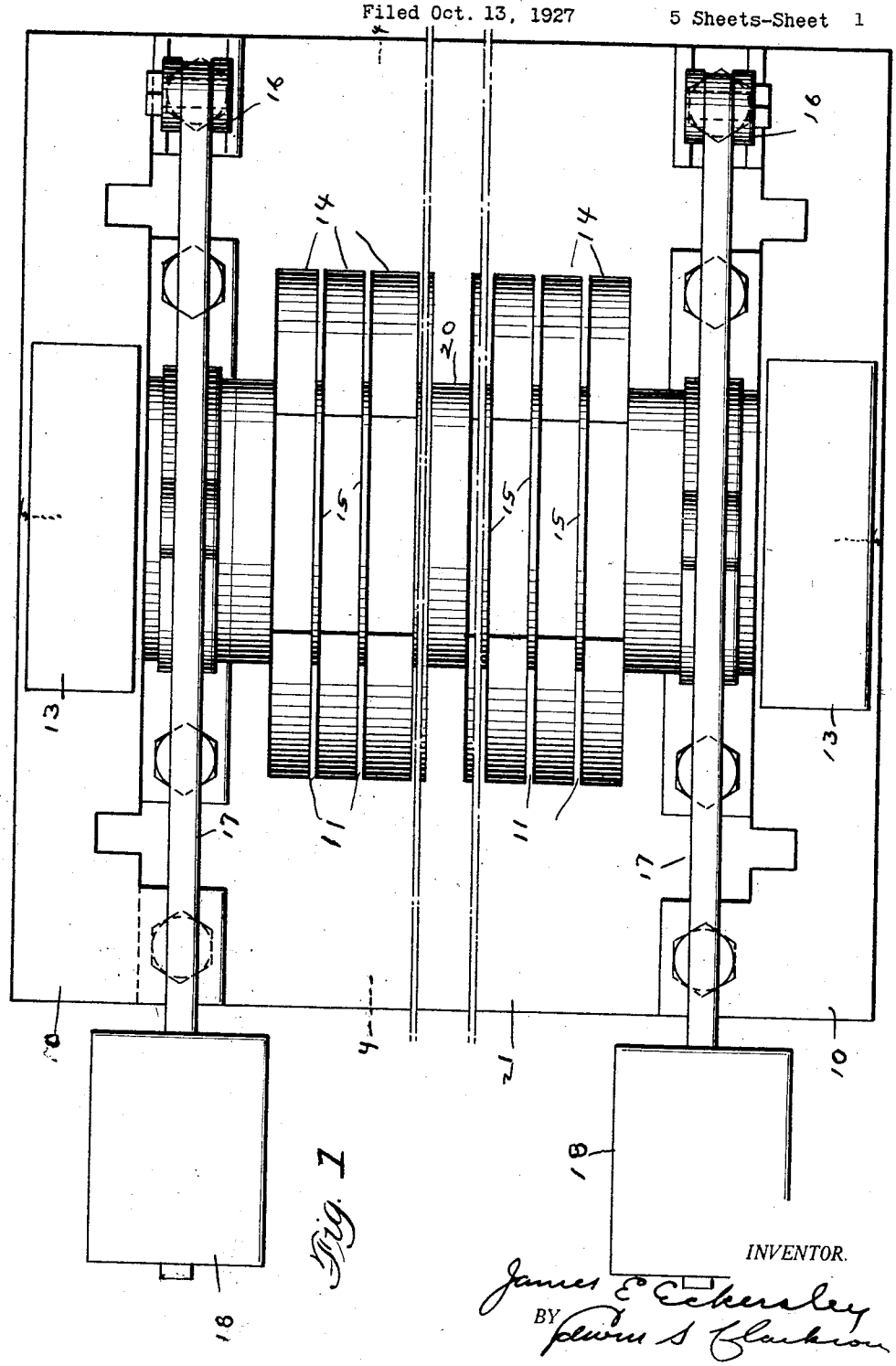


Fig. 1

INVENTOR.

James E. Eckersley

BY Edwin S. Clarkson

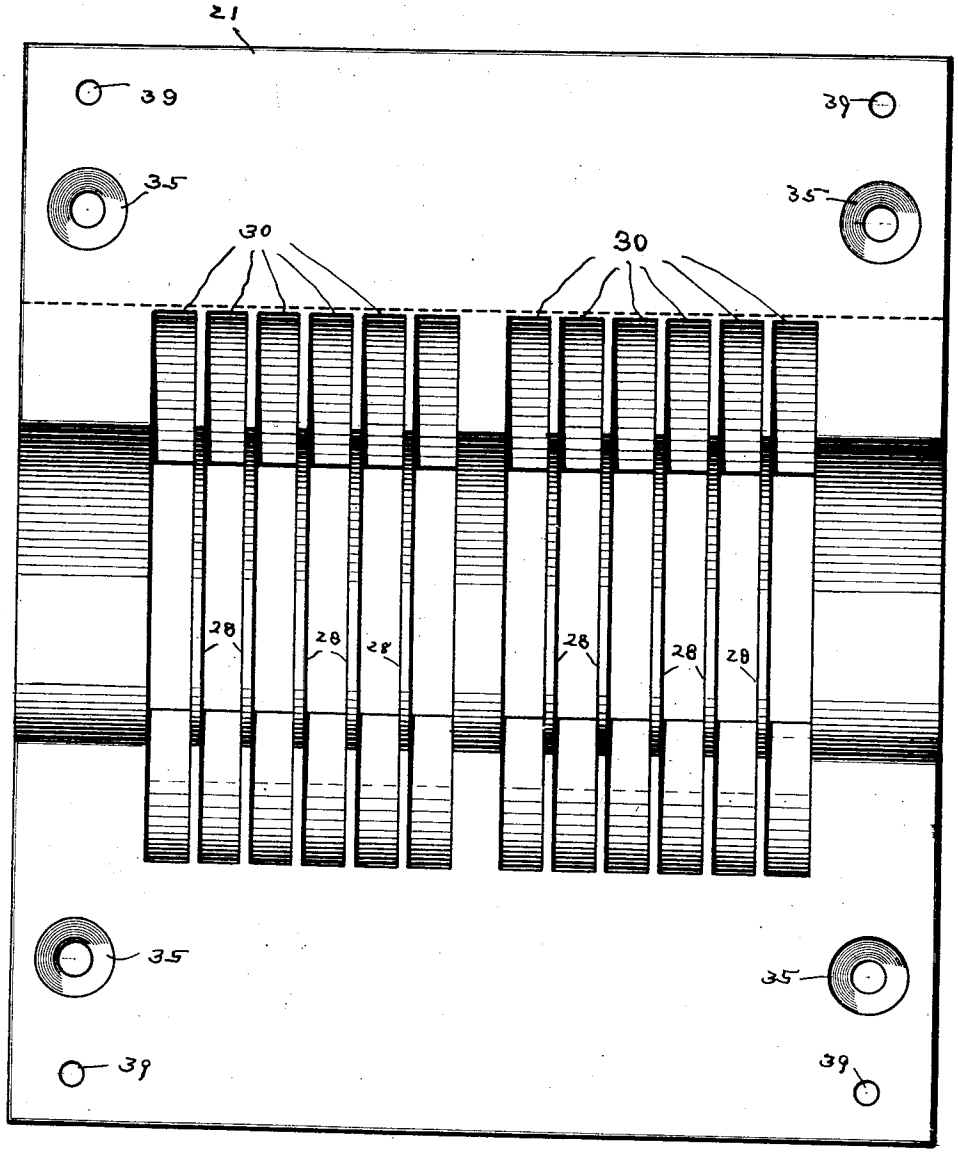
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MULTIPLE GROOVER MACHINE

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Fig 2



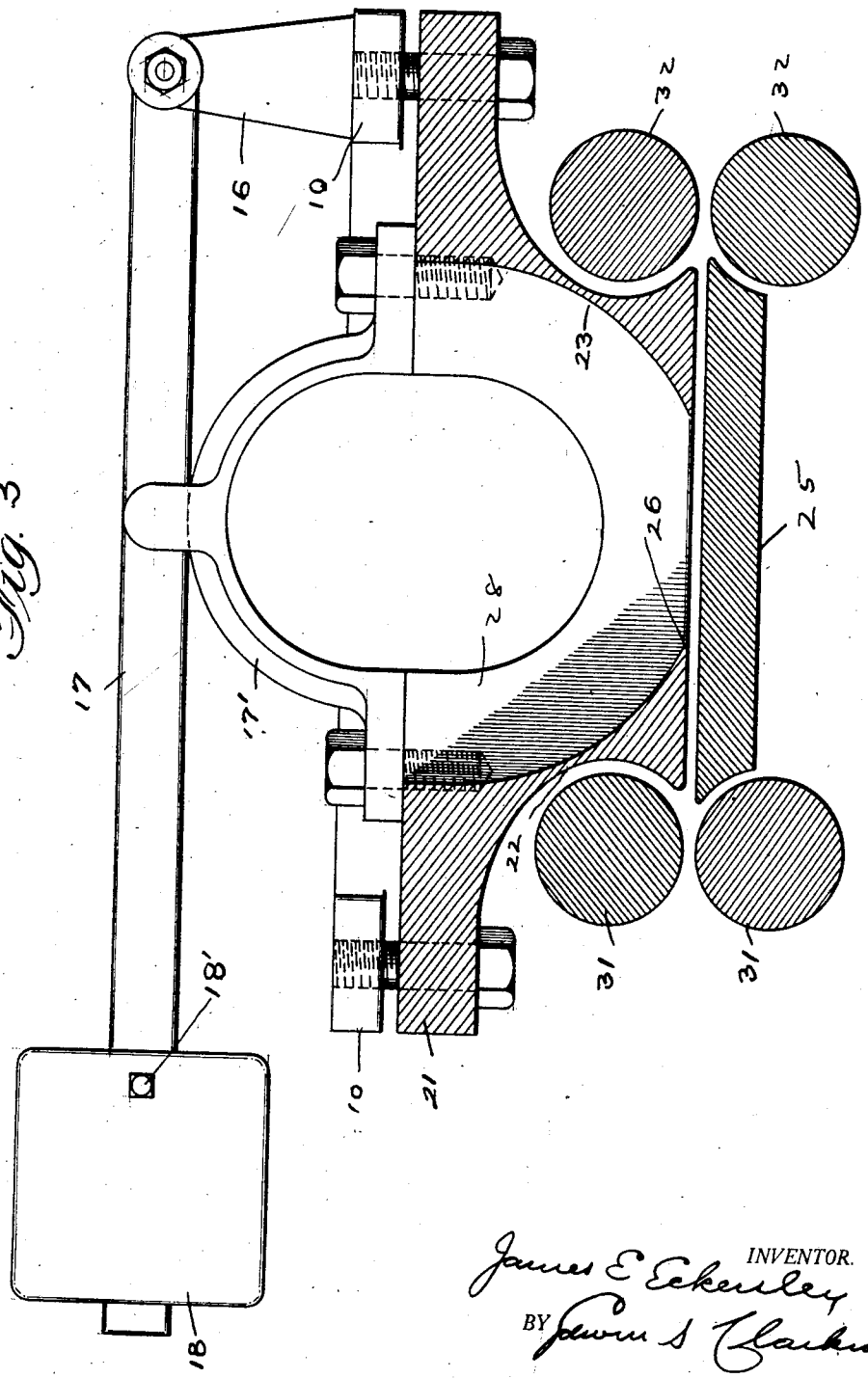
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April 9, 1929. J. E. ECKERSLEY 1,708,442

MULTIPLE GROOVER MACHINE

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Fig. 3



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MULTIPLE GROOVER MACHINE

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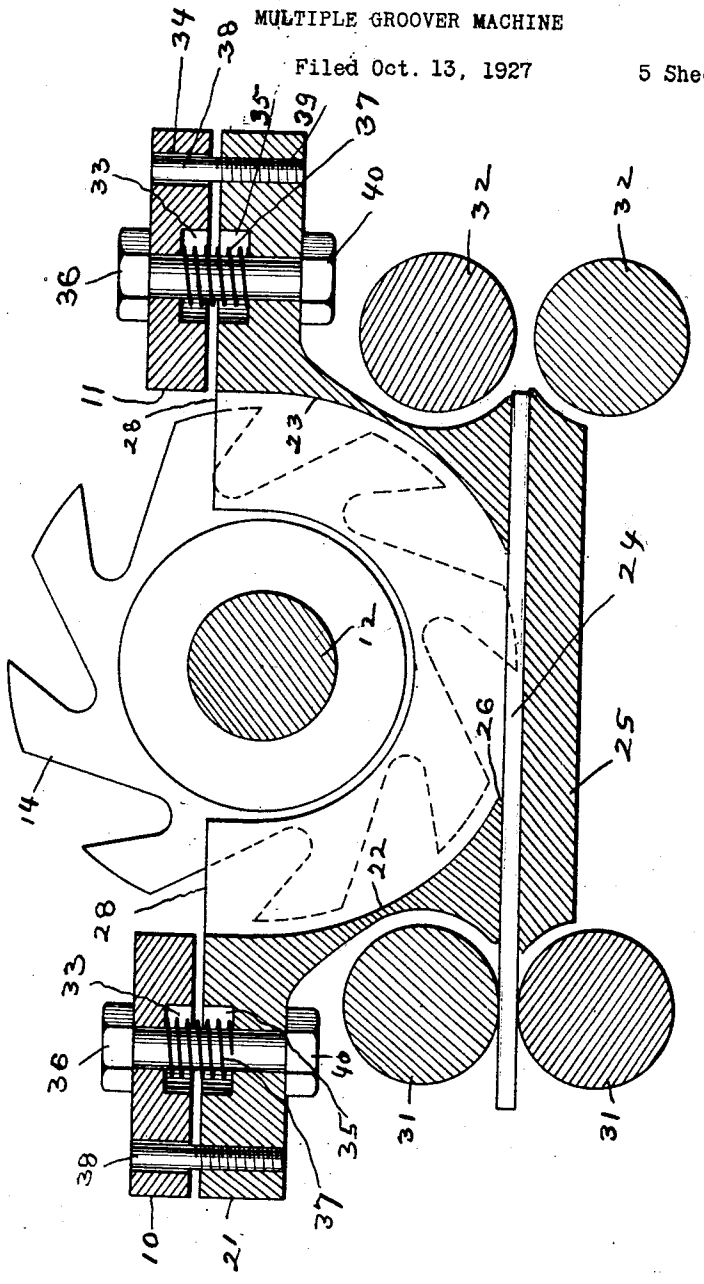


Fig. 4

James E. Eckersley INVENTOR.

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MULTIPLE GROOVER MACHINE

Filed Oct. 13, 1927 5 Sheets-Sheet 5

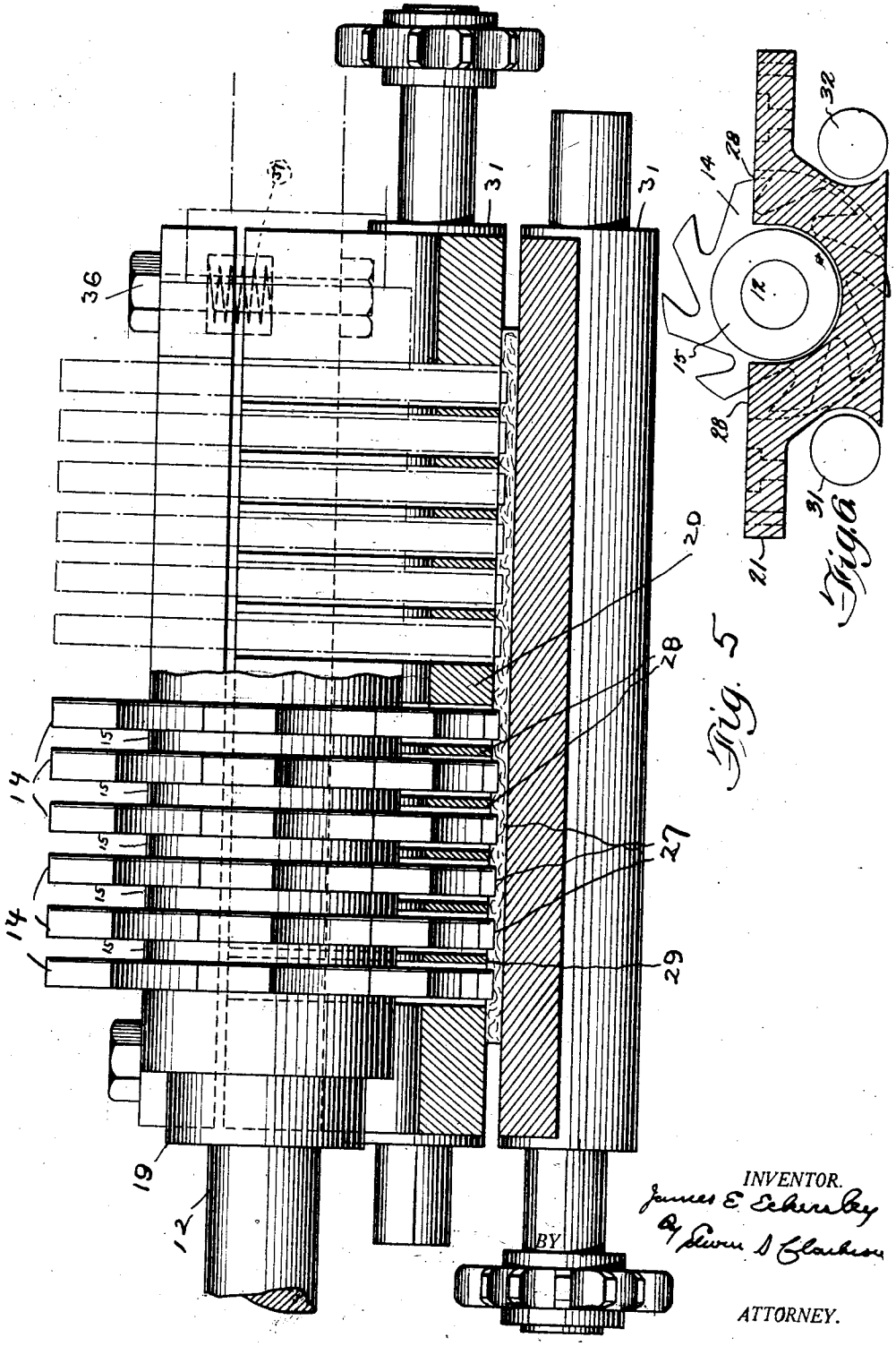


Fig. 5

Fig. 6

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Patented Apr. 9, 1929. 1,708,442

UNITED STATES PATENT OFFICE.

JAMES E. ECKERSLEY, OF ABERDEEN, WASHINGTON, ASSIGNOR OF ONE-HALF TO ALEXANDER POLSON, OF HOQUIAM, WASHINGTON.

MULTIPLE-GROOVER MACHINE.

Application filed October 13, 1927. Serial No. 226,023.

While my machine is particularly designed for forming wood battery spacers which are of thin straight grain construction, and are provided with a plurality of spaced grooves, it will, of course, be understood that its use is not limited to such products as it may be used to groove wood for any purpose.

In machines of this type it has been found that a considerable amount of the product produced must be condemned, and thrown aside, or culled, as they will not pass inspection because the ribs between the grooves are split, or the breaking edge of the chip removed by the cutter extends into the rib.

One of the objects of my invention is to provide means whereby the stock is flattened out and held in that position while it is being operated upon by the knives, or cutters of the machine in forming the grooves so that it is impossible for the knives to cut through the stock.

Another object of my invention is to provide what might be termed a floating pressure bar and chip breaker frame.

Another object of my invention is to provide a separate pressure bar between adjacent cutters to keep the stock while passing through the machine from raising or being drawn up into the cutters by irregularity of grain or warpage of the stock, also to hold the stock in uniform position against a bed plate.

A further object of my invention is to provide a combined pressure bar and chip breaker in align with and in front of the cutters and a pressure bar in align with and at the rear of the cutters.

A further object of my invention is to provide means for regulating the pressure exerted by the pressure bars on the stock.

A further object of my invention is to provide means to prevent one piece of stock climbing, or wedging under the preceding piece of stock in the machine.

In the drawings:

Figure 1 is a top plan view of my improved machine.

Figure 2 is a top plan view of the pressure bar frame detached.

Figure 3 is a transverse vertical sectional view of my improved pressure bar frame and immediately associated parts.

Figure 4 is a sectional view on the line 4—4, Figure 1.

Figure 5 is a sectional view on the line 5—5, Figure 1.

Figure 6 is a sectional view of the chip breaker frame, some of the associated parts being shown in elevation.

The reference number 10 designates the top plate, or fixed support, of my improved machine, suitably supported, said plate, or fixed support, being provided with a central elongated opening 11 therethrough to be hereinafter referred to. A shaft 12 is suitably secured to the fixed support in bearings 13.

A multiplicity of knives or cutters 14 are keyed to the shaft 12, the upper portions of which project through the opening 11 in the fixed support, as clearly shown in Figure 4, which cutters are spaced from each other on the shaft 12 by means of the spacers 15.

This fixed support 10 is provided with a standard 16 to which is pivoted a lever 17 having on its free end an adjustable weight 18, said weight being locked in adjusted position by means of the set screw 18′.

The knives or cutters are firmly held on the shaft 12 by means of the nut 19. As will be seen in Figure 5, the two groups of cutters are separated by the lug 20.

The pressure bar and chip breaker frame 21 is provided integrally with depending stock pressure bars 22 and 23, which are positioned fore and aft and in alignment with the cutters 14, and are adapted to hold the stock 24 firmly and flat upon the bed 25 of the machine, as shown in Figure 4. The bars 22 and 23 and partition 28 are in one solid piece. The bar 22, at its point 26 also functions as a chip breaker which breaks the chips cut from the grooves 27 (in the stock) said chips being separately broken in each individual groove, insuring the chips being broken off at either side edge of the partition 28, which might otherwise continue across the rib 29 of the stock, thereby eliminating the liability of the rib 29 being broken away, or torn through, and thus insuring a materially larger percentage of perfect products passing through the machine.

The frame 21 is provided with a number of milled recesses 30 to receive the cutters 14.

The pressure bars 28 are of required thickness in depth to function as separate pressure bars between the cutters to keep the stock 24 from raising or being drawn up into the knives by irregularity of grain, or

warpage of the stock, besides which they hold the stock in a uniform position against the bed plate 25. These pressure bars 28, as will be seen in Figure 4, bear on the rib 29 between the points of the pressure bars 22 and 23, so that the stock is held firmly throughout its length on the bed plate 25, as will be best seen in Figure 4.

Feed rolls, 31, and pulling rolls 32 are suitably mounted and are, in the present instance, shown to be chain operated, there being sprocket wheels on the upper rolls 31 and 32 which are thus positively driven.

As will be understood, the pressure bars 28 are cut away at their lowest point to allow for the separating collars 15 and the cutters 14 to nest down to their relative cutting positions as shown in Figure 4.

The fixed support 10 is provided with recesses 33 in its under face, and with smooth bore openings 34 which extend entirely through the support. The pressure bar frame 21 is provided with recesses 35, in its upper face which register with the recesses 33 in the fixed support. Bolts 36 pass through the fixed support and the pressure bar frame 21 and an expansion spring 37 surrounds said bolts in said recesses 33 and 35 (see Figure 4). Guide pins 38 are screwed into the pressure bar frame 21 at 39 and have smooth upper positions which slidably fit in the holes 34 in the fixed support. The bolts 36 are provided with lock nuts 40.

The springs 37 have a normal tendency to exert pressure on the pressure bar frame 21 which, with the weighted lever 17, hold the pressure bars firmly down upon the stock 24, and also maintain the chip breaker 26 in its proper operative position, and by reason of this construction the pressure bar frame may be termed a floating frame. Tension on the springs 37 is regulated by the adjustment of the lock nuts 40.

Should the stock be too short to reach from the feed rolls to the pulling rolls the pressure of the pressure bar 22 and the pressure bars 28 holds the stock firmly down throughout its length on the bed, thereby eliminating entirely the possibility of one piece of stock climbing on or wedging with the preceding piece of stock.

Suitable power may be applied to the shaft 12.

A suitable blower may be attached to my machine to remove the chips and shavings.

I may in some instances use only one of the tension pressure exerting devices; that is to say, either the weighted bar 17 or the springs 37. The lever 17 has a bearing on the yoke 17′ which, in turn, is connected to the bars 22 and 23.

What I claim is:

1. A groover of the kind described, including a fixed support, and a bed plate, in combination with a frame mounted between said support and bed plate, cutters mounted on said support, pressure bars depending from said frame before and after the cutters, pressure bars on said frame positioned between said cutters and adapted to exert pressure on the stock operated upon on each side of the cutters, and feed rolls to feed the stock to said cutters.

2. A groover of the kind described, including a fixed support, and a bed plate, in combination with a frame mounted between said support and bed plate, cutters mounted on said support, pressure bars depending from said frame before and after the cutters, pressure bars on said frame positioned between said cutters and adapted to exert pressure on the stock operated upon on each side of the cutters, and feed rolls to feed the stock to said cutters, and means to exert pressure on said pressure bars.

3. In a machine of the kind described an adjustably and yieldingly mounted frame, pressure bars depending from said frame, and adapted to exert pressure on the stock operated upon at points immediately before and after the cut made by the cutters, and other pressure bars on said frame adapted to exert pressure on the stock on each side of zone of cutting.

4. In a machine of the kind described, a pressure bar frame, a series of separate pressure bars carried thereby, said bars being positioned in the assembled machine between the cutters, and other pressure bars also carried by said frame and in line with the cutters.

5. In a machine of the kind described, the combination with a fixed support, a pressure bar frame movably secured to said support, expansion springs mounted between the support and said frame tending to press the frame from the support, and pressure bars depending from said frame to engage the stock operated on.

6. In a machine of the kind described, the combination with a fixed support, a pressure bar frame movably secured to said support, expansion springs mounted between the support and said frame tending to press the frame from the support, and pressure bars depending from said frame to engage the stock operated on, a weighted lever pivotally secured at one end to said support, and a yoke extending from the said frame and engaged by said lever.

7. In a machine of the kind described, a pressure bar frame, a series of separate pressure bars carried thereby, said bars being positioned in the assembled machine between the cutters, and combined pressure bars and chip breakers also carried by said frame and in line with the cutters.

In testimony whereof I affix my signature.

JAMES E. ECKERSLEY.