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F. J. VOIGT

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WOOD SLICING MACHINE

Filed Sept. 14, 1934

3 Sheets-Sheet 1

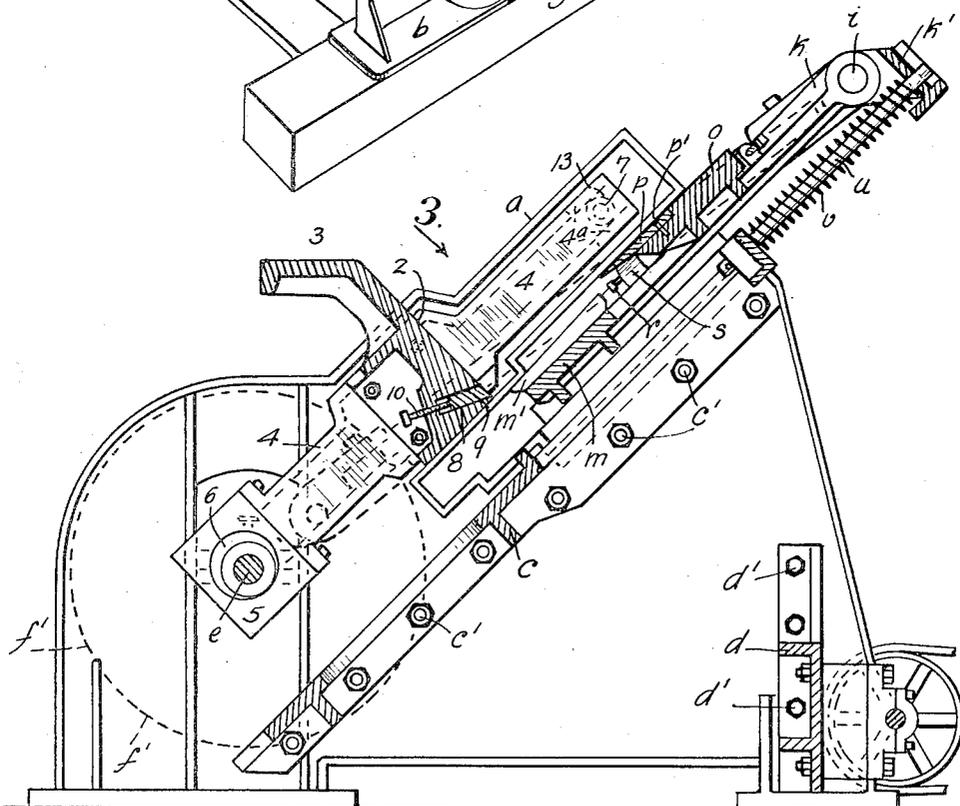
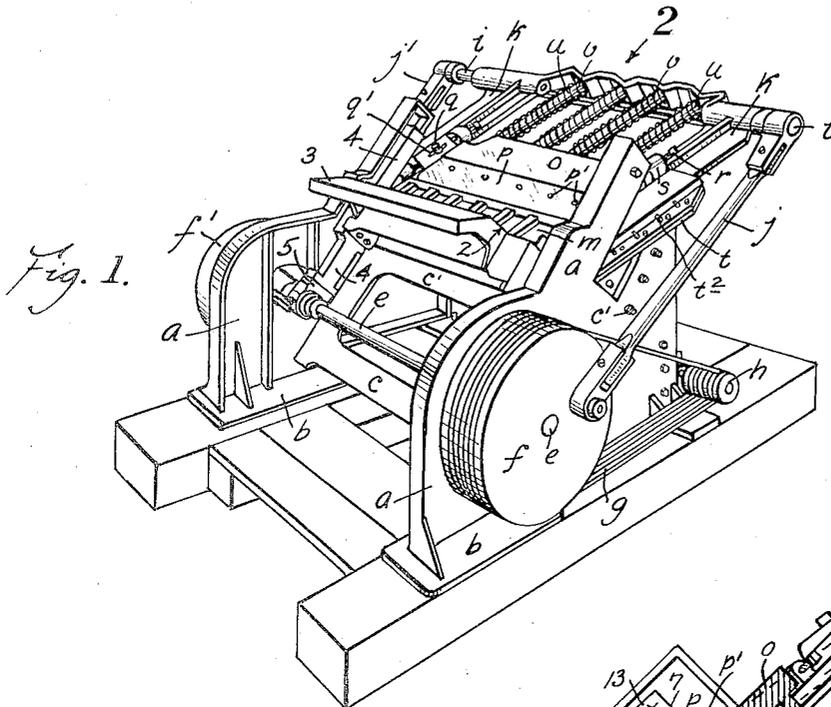


Fig. 2.

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3 Sheets-Sheet 2

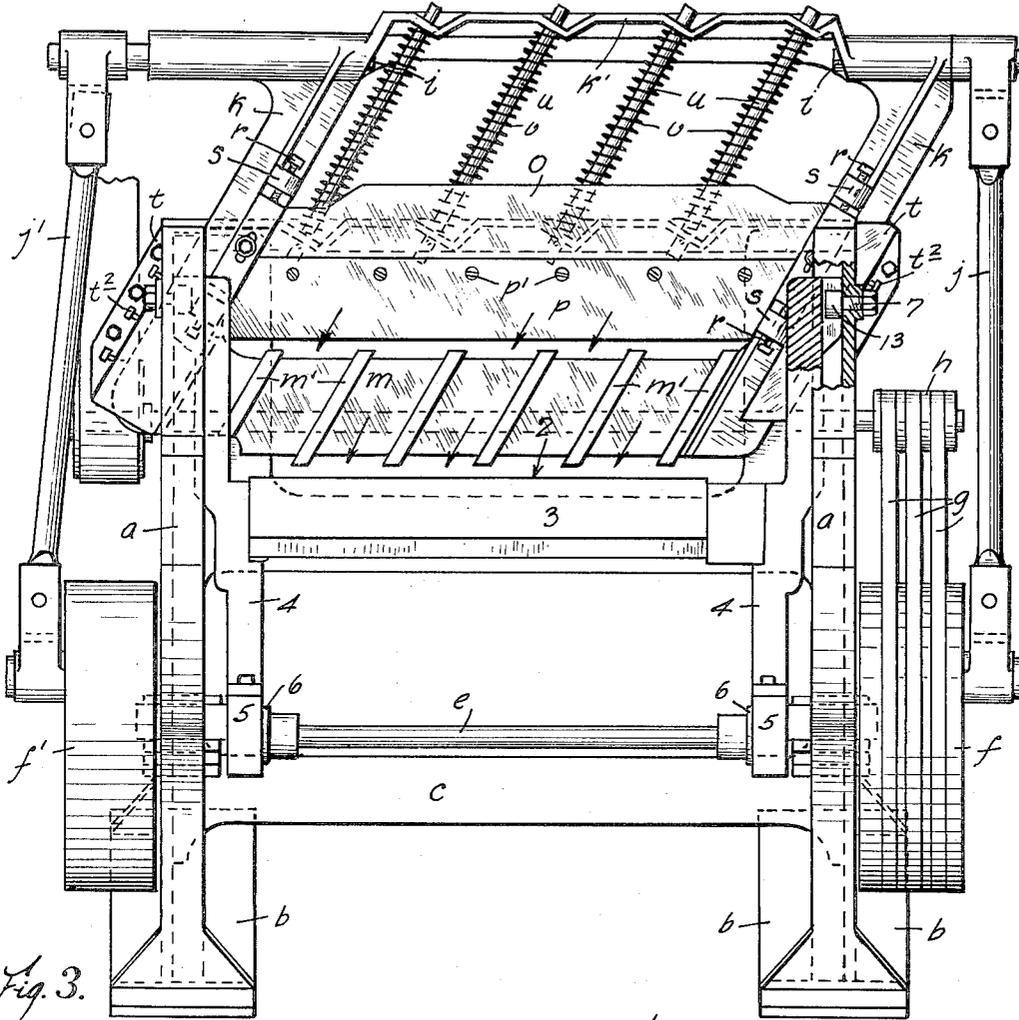


Fig. 3.

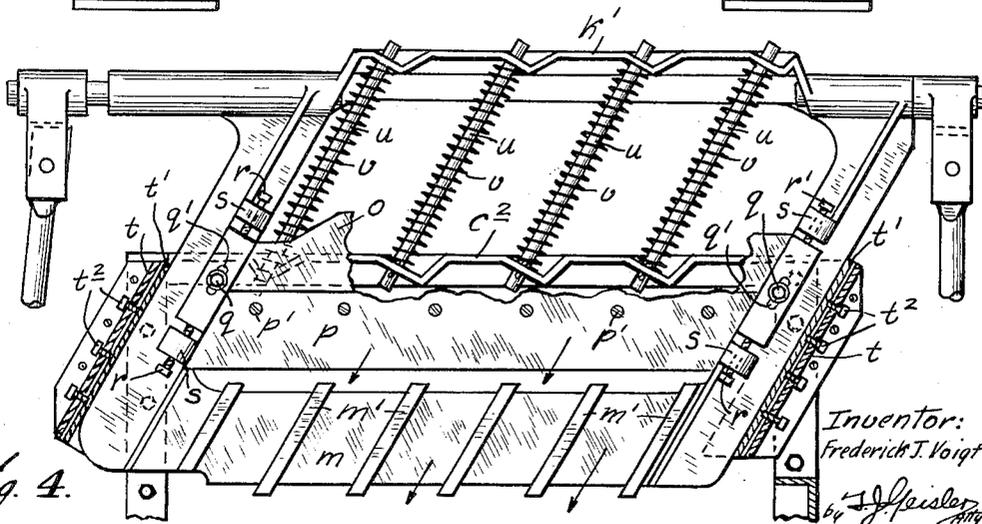


Fig. 4.

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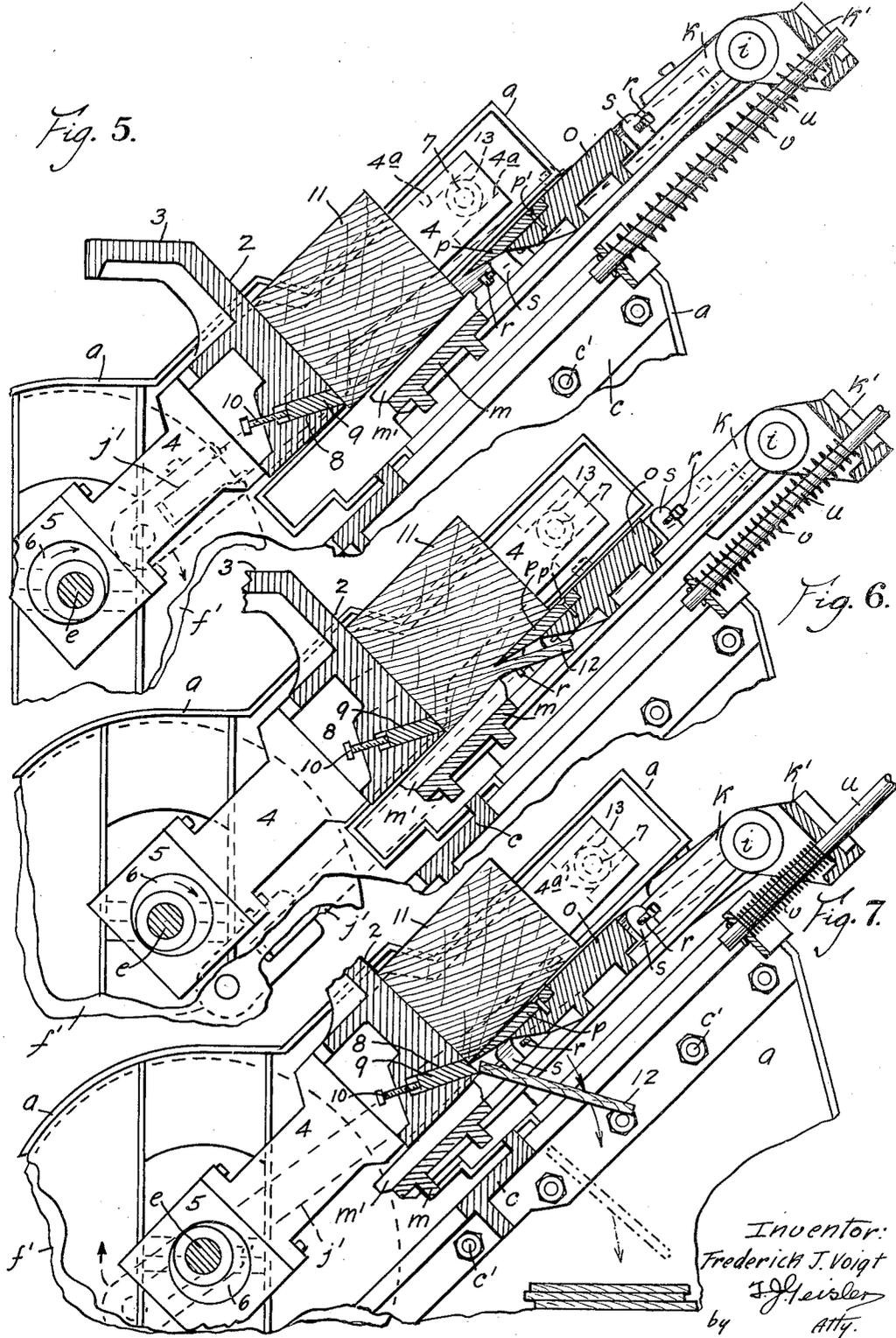
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WOOD SLICING MACHINE

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,008,317

WOOD SLICING MACHINE

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10 Claims. (Cl. 144—162)

My invention relates to a machine used for slicing thin strips from a block of wood, such strips as used in the making of boxes, or for veneers or similar purposes.

In machines of this character the slicing is done by means of a heavy knife; the block which is to be sliced is generally first treated with steam and heat and is placed on the shelf or block support provided in the machine, the block being further supported by a back-rest during the slicing operation.

I have discovered that in order to insure that the slices cut from the block will be straight and clean, and also to facilitate the cutting of thin slices, it is necessary that the block be firmly held against the back-rest during the cutting operation at a point approximately coinciding with the cutting edge of the knife; and that such holding of the block may be accomplished by subjecting the block to lateral pressure, that is, to a pressure more or less perpendicular to a cutting plane of the knife. Without imposing this lateral pressure on the block during this cutting operation of the knife, the irregular fibers of the wood often tend to cause heavy and uneven slices, and the cutting of thin slices is difficult.

I have further discovered that it is desirable to have the block fed automatically against the back-rest, constantly holding it against the latter, and that this may be practically accomplished by arranging the supporting face of the block support so as to decline at an angle, thus causing gravity to draw the block against the back-rest when the block is not engaged by the knife.

I have further discovered that strong lateral pressure between the block and back-rest may be developed by making the block support movable towards and from the back-rest and providing means for synchronizing movement towards the back-rest with the cutting movement of the knife and movement away from the back-rest with the return movement of the knife, thus causing said pressure to be applied during the cutting movement of the knife and withdrawing such pressure during the return movement of the knife.

The objects of my invention are to incorporate in a wooden block slicing machine the above mentioned features, and I attain the objects by the devices and combinations hereinafter fully described with reference to the accompanying drawings.

In such drawings:

Fig. 1 is a perspective elevation of my machine with the slicing knife in raised position;

Fig. 2 is a larger scale vertical section of my ma-

chine approximately taken on the line pointed by the arrow 2 in Fig. 1;

Fig. 3 is a still larger scale front elevation of my machine looking in the direction pointed by the arrow 3 in Fig. 2;

Fig. 4 is a fragmentary detail of the upper part of my machine as shown in Fig. 3; and

Figs. 5, 6 and 7 are fragmentary, more or less diagrammatic vertical sections of my machine illustrating in their order relative positions of the wooden block, the block support or shelf, the back-rest for the block, and the slicing knife, during the cutting operation of the latter. Thus Fig. 5 shows the position of said parts before the beginning of the slicing operation; Fig. 6 shows their position when the slicing operation is one-half completed; and Fig. 7 shows their position when the slicing operation is completed.

My machine comprises a supporting frame consisting of side uprights *a*, *a* having bases *b* and braces *c* and *d* connected to the side uprights by bolts *c'* and *d'*, respectively. To both ends of a shaft *e*, journaled in the side uprights *a*, are attached heavy disks *f* and *f'*, one of which, *f*, is driven by means of belts *g* from a pulley *h*, driven by any suitable means, for example a motor (not shown). The disks *f* and *f'* are connected by articulated arms *j* and *j'*, to the ends of the rod *i*, which carries the upper end of the frame *k*, to which is fastened the back-rest *m* (see Figs. 3 and 4) and the supporting bar *o* of the slicing knife *p*. The slicing knife *p* is fastened to the bar *o* by screws *p'* and the bar *o* in turn is attached to the frame *k* by a pair of bolts *q* passing from the frame *k* thru the slots *q'* in the ends of the bar *o*. These slots *q'* enable a slight adjustment to be made in the position of the bar *o* when the bolts *q* are loosened, such adjustment being regulated by the set screws *r*, *r'* threaded in the lugs *s* on the frame *k*, the said set screws *r*, *r'* bearing against the ends of the bar *o*. The frame *k* is adapted to slide in guides *t*, each composed of a top and bottom member, which members are bolted together, and each bottom member is also screwed to an upright *a*. These guide tracks may be made with removable linings *t'* held in place by screws *t2* to permit the linings to be renewed when required by wear. As shown by Figs. 3 and 4, the sides of frame *k* are not perpendicular to the rod *i* and the guide tracks *t* are so arranged as to permit the frame *k* to slide obliquely with reference to the uprights *a* in order that the knife *p* will make a slicing cut. The top of the frame *k* comprises a cross bar *k'* and one of the frame members *c* also is provided at its top with a cross bar *c2*. Rods

u are rigidly supported by said cross bar $c2$ and are slidably supported in said cross bar k' . On the rods u are mounted expansion springs v . It will be seen from Figs. 1 and 3 that each revolution of the disks f, f' will cause the articulated arms j, j' to pull the rod i and therewith the frame k , the back-rest m and the slicing knife p down for cutting one slice (as shown by 12) off the block 11. With the downward movement of the frame k the rods u will be projected thru the holes in the upper cross bar k' and thus compress the springs v . With the lifting movement of the arms j, j' and the return of the frame k and therewith the knife and back-rest to normal or initial position during the completion of the revolution of the disks f, f' , these springs v will be expanded.

The supporting shelf 2, which holds the block of wood during the slicing, is made with a front apron or flange 3 for convenience in sliding the block of wood on to the shelf. The shelf 2 is firmly bolted to the rocker arms 4, the lower ends of which are provided with journal boxes 5 in which bear cams 6 rigidly mounted on the shaft e . The upper ends of the rocker arms 4 are provided with guide webs 4a, see Figs. 5, 6 and 7, adapted to slide on a roller 13 mounted on a pin 7 attached to the frame upright a , thus enabling the rocker arm 4, and therewith the block supporting shelf 2, to rock and move towards and away from the back-rest in coincidence with the rotation of the cams 6 on the shaft e .

The shelf 2 is provided with a slot 8 in which is inserted a strip of hard wood 9 adjustable by set screws 10. This strip 9 serves as the bottom cutting surface for the slicing knife. The back-rest m is provided with a series of ribs m' which, as shown in Figs. 5, 6 and 7, recede downward from a place parallel with the front face of the knife p .

The manner in which my slicing machine operates is illustrated in Figs. 5, 6 and 7. In Fig. 5 the block of wood 11, ready for slicing, has been placed on the supporting shelf 2, and, since this shelf is inclined backward at an angle of about 45° the block of wood is caused to slide down by gravity and rest against the upper ends of the ribs m' of the back-rest m . The slicing knife p , as seen in Fig. 5, is in raised position and ready for its downward cutting stroke.

As further shown by Fig. 5, the angle made by the supporting shelf 2 with the back-rest m and also with the blade of the knife p at this instance is slightly less than 90°. This causes the block of wood 11, which is of rectangular cross section, to bear against the back-rest at the upper end only, and this is also accentuated by the fact that the ribs m' of the back-rest m recede slightly downward. The shaft e and cams 6 turn in a clockwise direction, as indicated by the arrow. When the edge of the slicing knife strikes the top of the block 11, it will exert such pressure on the block as would ordinarily be sufficient to prevent any outward sliding of the block on the supporting shelf 2 away from the back-rest. When the slicing knife descends, however, the back-rest descends with it, and at the same time the cams 6 cause the supporting shelf 2 to be moved inward and into the position shown in Fig. 6. In this position the slicing knife is half way thru the block. The downward force of the knife blade holds the block firmly on the shelf, but the inward movement of the shelf causes great lateral pressure to be exerted against the top of the ribs

m' by the rear face of the block. The angle made by the top of the shelf 2 with the plane of the slicing knife p has also become slightly greater. This tends to relieve the pressure of the upper part of the block against the face of the slicing knife p . In other words, the point of greatest lateral pressure is exactly where the slicing is taking place.

Referring now to Fig. 7, it will be seen that the slicing knife p has completed its downward stroke and has reached the strip of hard wood 9. The back-rest has passed below the back of the shelf 2 leaving the strip of wood 9 which has been sliced off free to fall down behind the machine. The journals 5 and the bottoms of the supports 4 are in their extreme inward position. The angle made by the shelf 2 with the plane of the slicing knife p is slightly greater than 90°. It will be noticed that the rear face of the block 11 does not touch the knife blade at the top, consequently, as the knife blade is drawn upward, there will be very little friction between knife blade and wood block, which would round off and wear away the cutting edge of the knife blade. When the knife blade again reaches its position above the block 11, the force of gravity will cause the block 11 once more to slide back against the ribs m' of the back-rest m and block slicing knife and back-rest are again in the position indicated by Fig. 5.

Referring again to Fig. 3, it is clearly seen that due to the diagonal downward movement of the frame k and slicing knife p the knife has an oblique cutting motion; while this is not absolutely necessary and my machine would work also if the knife descended in a line at right angles to the shelf and block, I have found that this oblique movement of the knife facilitates clean and even slicing. My slicing machine accordingly is entirely automatic.

I have found it possible with the construction described to run my machine at a very high rate of speed; I have been able to make thin, even slices and to cut the blocks quite close to the front face. It is, of course, desirable to turn the blocks if it is not required to have the slices all of the same width, and this can be done without even stopping the machine. By removing such a large percentage of the friction between the face of the slicing knife and the rear face of the block during the upward movement of the knife, I have found that the life of the cutting edge of the slicing knife is very materially lengthened. By making the wheels f and f' very heavy, by having springs u on the rods u' , by having the diameter of the pulley h small in comparison to that of the wheels f and f' and by running my machine at a high rate of speed, I have found that a very even, regular movement is obtained and the machine has proven itself by repeated tests to be highly satisfactory.

I claim:

1. In a wooden block slicing machine the combination of a reciprocated slicing knife, a movable support and a back-rest for the block, the back-rest moving with the knife and adapted to provide a bearing for the block at a point approximately coinciding with the cutting edge of the knife, and means for reciprocating said knife and for moving said block support towards and from the back-rest in synchronism with the cutting and return movements of the knife, whereby the block support constantly causes lateral pressure of the block against the back-rest at the point where the knife is cutting thru the block,

and said pressure is removed during the return movement of the knife.

2. In a wooden block slicing machine the combination of a reciprocated slicing knife, a support and a back-rest for the block, the back-rest moving with the knife and adapted to provide a bearing for the block at a point slightly below the cutting edge of the knife, and means for reciprocating said knife and for moving said block support towards and from the back-rest in synchronism with the cutting and return movements of the knife, whereby the block support constantly causes lateral pressure of the block against the back-rest at the point where the knife is cutting thru the block, and said pressure is removed during the return movement of the knife.

3. In a wooden block slicing machine the combination of a reciprocated slicing knife, a support and a back-rest for the block, the supporting face of the block support sloping inward, the back-rest moving with the knife and adapted to provide a bearing for the block at a point approximately coinciding with the cutting edge of the knife, and means for reciprocating said knife and for moving said block support towards and from the back-rest in synchronism with the cutting and return movements of the knife, whereby the block support constantly causes lateral pressure of the block against the back-rest at the point where the knife is cutting thru the block, and said pressure is removed during the return movement of the knife.

4. In a wooden block slicing machine the combination of a reciprocated slicing knife, a support and a back-rest for the block, the supporting face of the block support sloping inward, the back-rest moving with the knife, the bearing face of the back-rest receding downwardly from a plane parallel to the plane of the knife, and adapted to provide a bearing for the block at a point approximately coinciding with the cutting edge of the knife, whereby the block support constantly causes lateral pressure of the block against the back-rest at the point where the knife is cutting thru the block, and said pressure is removed during the return movement of the knife.

5. In a wooden block slicing machine the combination of a reciprocated slicing knife, a rockable support and a back-rest for the block, the supporting face of the block-support sloping inward, the back-rest moving with the knife, the bearing face of the back-rest receding downwardly from a plane parallel to the plane of the knife and adapted to provide a bearing for the block at a point slightly below the cutting edge of the knife, and means for reciprocating said knife and for moving said block support towards and from the back-rest in synchronism with the cutting and return movements of the knife, whereby the block support constantly causes lateral pressure of the block against the back-rest at the point where the knife is cutting thru the block, and said pressure is removed during the return movement of the knife.

6. In a wooden block slicing machine the combination of a reciprocated slicing knife, a block support having angular movement with respect to the plane of the slicing knife, the supporting face of the block support sloping inward, a back-rest for the block, said back-rest moving with the

knife and adapted to provide a bearing for the block at a point approximately coinciding with the cutting edge of the knife, and means for synchronizing said angular movement of the block support with the cutting and return movements of the knife, whereby the block support causes lateral pressure of the block against the back-rest at the point where the knife is cutting thru the block, and said pressure is removed during the return movement of the knife.

7. In a wooden block slicing machine the combination of a reciprocated slicing knife, arms pivoted at one end and supported by a cam at the other, a block support carried by said arms, the supporting face of the block support sloping inward, a back-rest for the block, said back-rest moving with the knife and adapted to provide a bearing for the block at a point approximately coinciding with the cutting edge of the knife, and means for synchronizing the operation of said cam with the cutting and return movements of the knife, whereby the block support causes lateral pressure of the block against the back-rest at the point where the knife is cutting thru the block, and said pressure is removed during the return movement of the knife.

8. A frame including inclined uprights, a carrier mounted on said frame, and longitudinally obliquely reciprocable, a slicing-knife and a back-rest carried by said carrier, a block support mounted on the frame, the supporting face of said block support arranged perpendicular to the plane of said knife, and means for reciprocating said carrier and moving said block support towards and from the back-rest in synchronism with the cutting and return movements of the knife.

9. A frame including inclined uprights, a carrier mounted on said frame, and longitudinally obliquely reciprocable, a slicing-knife and a back-rest carried by said carrier, arms pivotally and slidably supported at one end on said frame, a rotary cam element supporting the other end of said arms, a block support carried by said arms, the supporting face of said support arranged perpendicular to the plane of said knife, means for reciprocating said carrier and for rotating said cams, whereby to move the block support towards and from the back-rest in synchronism with the cutting and return movements of the knife.

10. In a wooden block slicing machine the combination of a reciprocated slicing knife, a block support having angular movement with respect to the plane of the slicing knife, the supporting face of the block support sloping inward, a back-rest for the block, said back-rest moving with the knife, the bearing face of the back-rest receding downwardly from a plane parallel to the plane of the knife and adapted to provide a bearing for the block at a point approximately coinciding with the cutting edge of the knife, and means for synchronizing said angular movement of the block support with the cutting and return movements of the knife, whereby the block support causes lateral pressure of the block against the back-rest at the point where the knife is cutting thru the block, and said pressure is removed during the return movement of the knife.