S. CARLIN.

MACHINE FOR MAKING BOX SPLINTS, VENEERS, SHINGLES, &c.

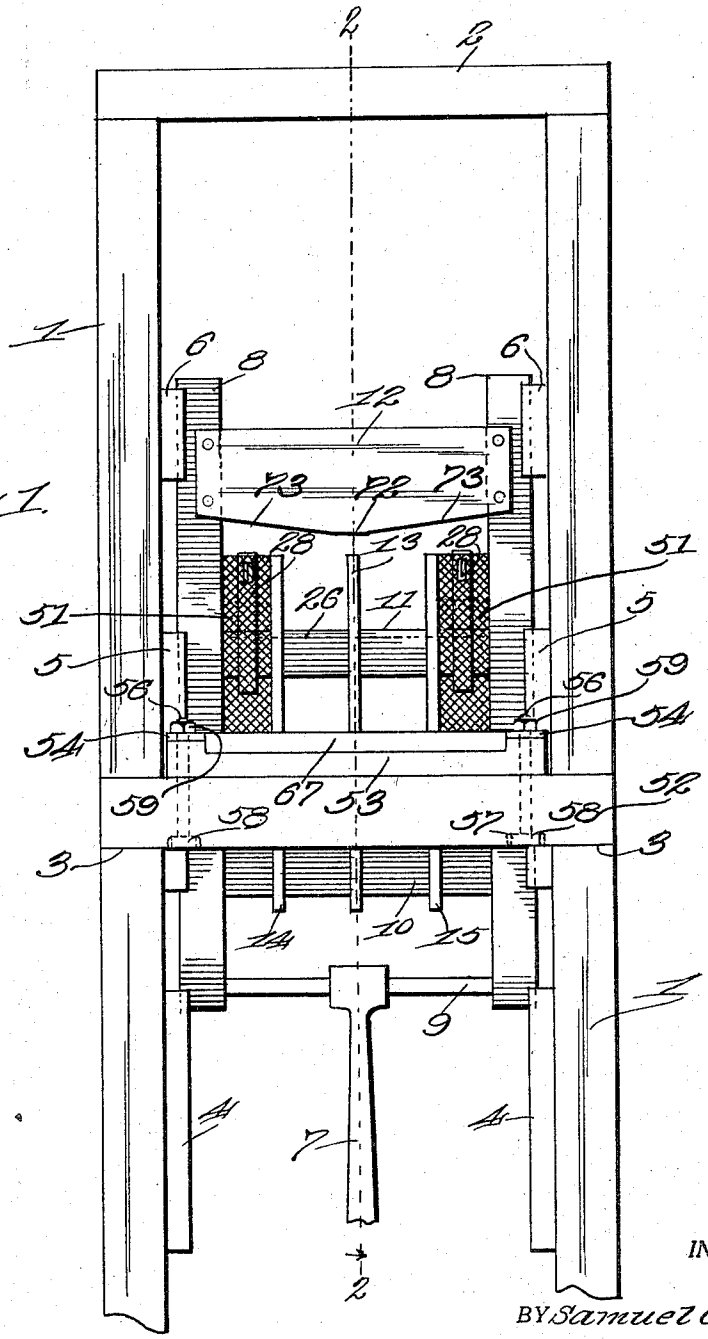
APPLICATION FILED DEC. 4, 1916.

1,226,185.

Patented May 15, 1917.

3 SHEETS—SHEET 1.

Fig. 1.



INVENTOR.

BY Samuel Carlin

Carl M. Crawford ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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3 SHEETS—SHEET 2.

Fig. 4.

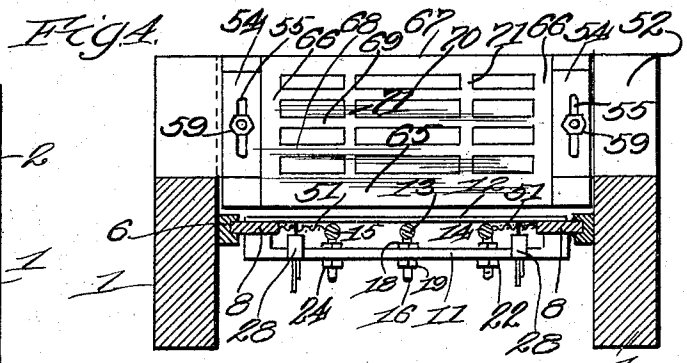


Fig. 2

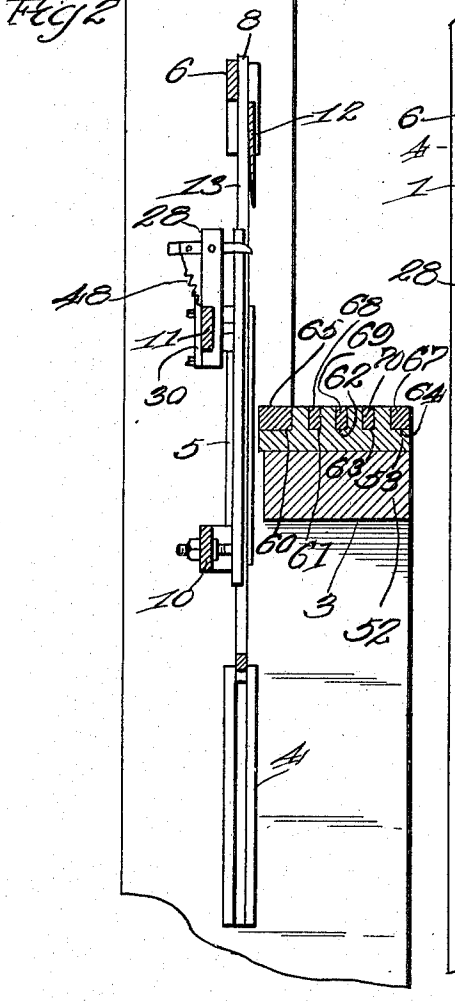
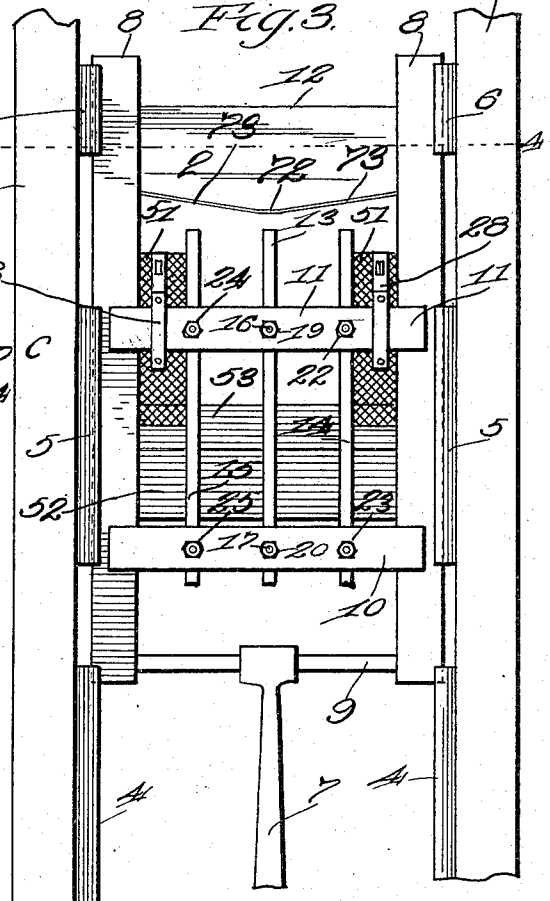


Fig. 3.



INVENTOR.

Samuel Carlin

BY

Earl M. Crawford

ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

S. CARLIN.

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3 SHEETS—SHEET 3.

Fig. 5.

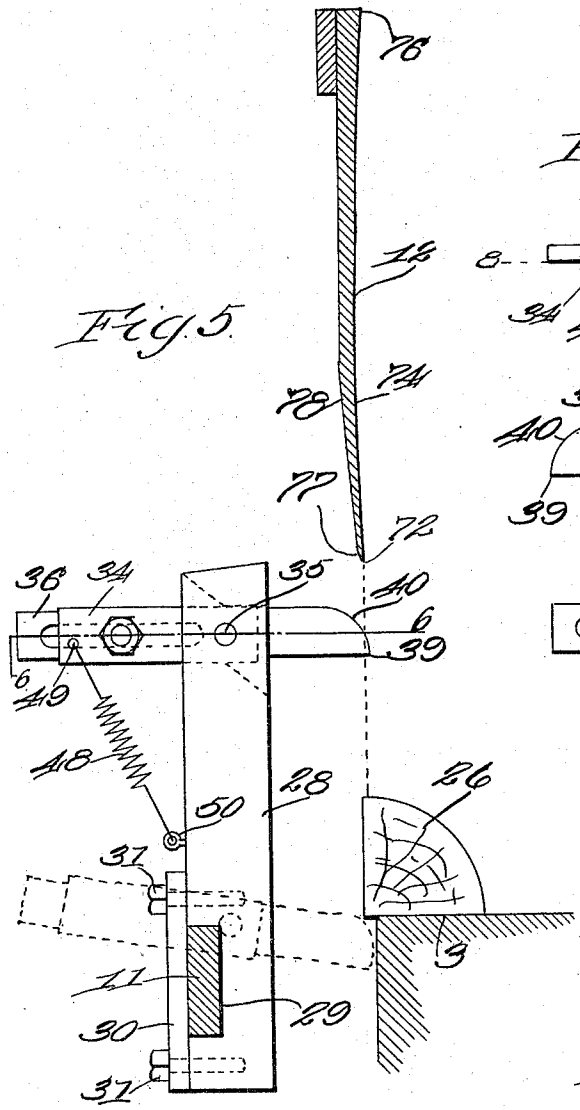


Fig. 6.

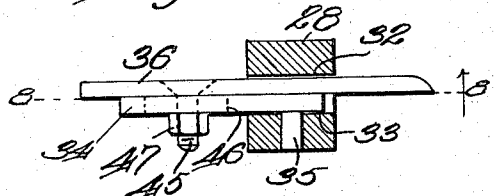
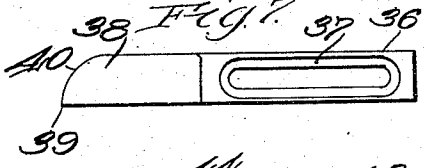


Fig. 7.



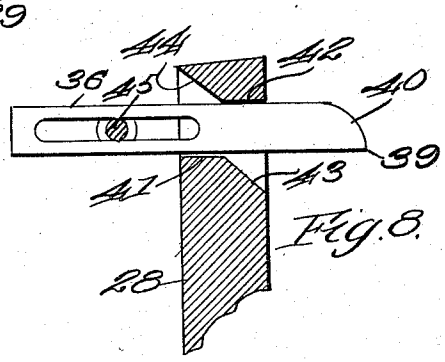


Fig. 8.

Fig. 9.

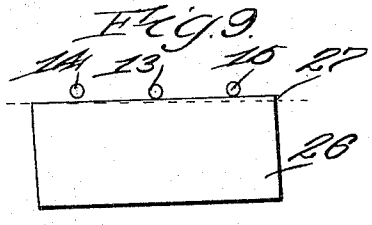
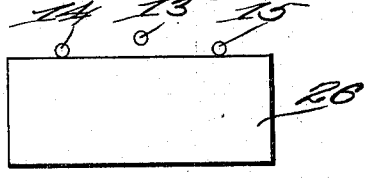


Fig. 10.



INVENTOR.

Samuel Carlin

BY

Earl M. Crawford

ATTORNEY.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

SAMUEL CARLIN, OF SPOKANE, WASHINGTON, ASSIGNOR OF ONE-HALF TO ERNEST MORIN, OF SPOKANE, WASHINGTON.

MACHINE FOR MAKING BOX-SPLINTS, VENEERS, SHINGLES, &c.

1,226,185. Specification of Letters Patent. Patented May 15, 1917.

Application filed December 4, 1916. Serial No. 134,921.

To all whom it may concern:

Be it known that I, SAMUEL CARLIN, a citizen of the United States, residing at Spokane, in the county of Spokane and State of Washington, have invented new and useful Improvements in Machines for Making Box-Splints, Veneers, Shingles, &c., of which the following is a specification.

This invention relates to improvements in machines for making box splints, veneers, shingles, etc., under the well known method of steaming the wood blocks from which these articles are formed so that the veneer, splint or the like can be sliced off from the stock by a reciprocating knife.

These reciprocating knives, which are usually mounted in or upon a knife frame, are operated at a fairly high speed and where dependence is placed upon hand or manual feed of the stock, it is important to avoid unnecessary movement of the stock as otherwise the speed of the machine would be limited to the speed of the feeder.

Therefore it is a primary object of my invention to provide a slicing machine of this character wherein a stock or wood block may be constantly moved toward the knife without necessitating retraction therefrom.

In making box sides, tops, bottoms, etc., it is necessary, especially in apple boxes, to have the parts produced in accordance with the legal length requirements.

It is one of the objects of my invention to provide a machine which will not only slice off a box splint, but which will in addition thereto, score or groove the stock so that when the box splint is sliced off it will not only be of the required thickness, but also, of the required length, the entire product being formed by one downward or working stroke of the knife frame. Therefore my invention involves grooving devices, and a special feature of novelty consists in providing knives for grooving the stock which are movably mounted so that upon the return stroke, they will recede or retract, upon engagement with the stock, so that the scoring knives can pass upwardly or along the stock into a starting position. After the knives are in a starting position, they are actuated into a working position so that upon a next down stroke of the knife frame they will groove the block, this retraction of the grooving knives serving to permit the feeder to always urge the block toward the knife without the necessity of alternately retracting the stock to permit the grooving knives to return past the same.

My invention also includes novel gage means which is mounted upon the knife frame and which is adapted to be adjusted either for making box splints or shingles, the gage means taking the form of gage bars which are each independently adjustable not only with respect to each other, but as regards their relative plane to the slicing knife. By means of this independent adjustment, I am able to employ one of these gage bars as a fulcrum bar, when making shingles, the other or remaining bars being abutment bars, thereby permitting the feeder to alternately shift the stock in forming the butt ends of the shingles alternately, end to end, with respect to the stock. My invention also has to do with a novel form of feed table together with an improved finger guard, and also other features and objects which will be more fully described in connection with the accompanying drawings and which will be more particularly pointed out in and by the appended claims.

In the drawings:—

Figure 1 is a view in front elevation looking from the table side of the machine and showing the knife frame in an upper position.

Fig. 2 is a central vertical sectional view on line 2—2 of Fig. 1.

Fig. 3 is a rear view looking in a direction opposite to the direction from which the machine is viewed in Fig. 1.

Fig. 4 is a horizontal sectional view on line 4—4 of Fig. 3.

Fig. 5 is an enlarged fragmentary sectional view showing the main slicing knife in section and one of the grooving knife devices and illustrating the relation thereof to the stock on the table.

Fig. 6 is a sectional view on line 6—6 of Fig. 5, with the knife and the knife bar in elevation.

Fig. 7 is a view in elevation of one of the scoring knives removed from its mounting.

Fig. 8 is a sectional view on line 8—8 of Fig. 6.

Fig. 9 is a plan view illustrating the dis-

position of the gage rods and a block of wood when making shingles.

Fig. 10 is a similar view illustrating the disposition of the gage rods when making box splints or veneers.

Like characters of reference designate similar parts throughout the different figures of the drawings.

In the accompanying drawings, I have shown one form of my invention which includes a frame comprising uprights 1, and a top beam 2, which latter connects the uprights 1 to form a rigid frame structure. The uprights 1 are reduced to form table supporting shoulders 3, for supporting a table of novel construction which I will subsequently describe.

Secured to the inner faces of the frame members 1 is a plurality of guides 4, 5 and 6 which serve to hold a knife frame to a linear path of reciprocating movement. A suitable power shaft, not shown, will be provided for connection with a connecting rod 7 to impart reciprocating movement to the knife frame, which I will now describe in detail.

The knife frame comprises vertical members 8 which are shown connected at their lower ends by a cross bar 9, to which the connecting rod 7 is suitably united. Between the ends of said members I provide cross bars 10 and 11 which are rigidly connected to said vertical members 8. While the function of these cross bars 10 and 11 is not solely to strengthen and connect the members 8, this is one function which these cross bars 10 and 11 incidentally perform. At or near the upper ends of said members 8, the main slicing knife 12, is mounted, and this slicing knife may constitute a strengthening member for the upper ends of said vertical members 8. Said members 8 fit in and are adapted to reciprocate, as a whole, in the guides 4, 5 and 6, mounted upon the uprights 1, under the action imparted thereto by the connecting rod 7.

I will next describe an improved gage means for limiting movement of the stock toward or under the slicing knife 12 in order to provide for cutting or slicing splints, veneers or shingles of a predetermined thickness.

As illustrated, my improved gage means is mounted upon the knife frame, and more specifically speaking, upon the cross bars 10 and 11, which I will hereinafter term gage supports. My improved gage means comprises, in the form shown, three gage rods or bars which I will designate as 13, 14 and 15. These bars, as shown more particularly in Figs. 1, 2 and 3, are vertically disposed and they extend from a point just below the main slicing knife, when the latter is in a normal or upper position, below the feed table 3, thereby always presenting a gage surface against which the stock may be advanced into range of the cutting knife. A feature of my improved gage means consists in providing independent adjusting devices for each gage bar whereby said bars may be independently adjusted at remote points along their length not only to square up said bars with respect to the plane of reciprocating travel of the slicing knife, but also for the purpose of bodily adjusting said gage rods or bars with respect to each other, either for making box splints or sides or for making shingles, which will be presently described.

As illustrated, each gage rod or bar is adjustably connected with each gage supporting bar. Inasmuch as the adjustable connections are all identical in operation and structure, only the adjustable connections for one bar need be described in detail. Referring to bar 13, the same is provided with upper and lower threaded gage bolts 16 and 17, brazed or otherwise rigidly secured to said bar 13 and having exterior threads thereon. The gage supports 10 and 11 are provided with bores through which the bolts 16 and 17 project and I provide nuts 18 and 19 on opposite sides of the support 11, and similar nuts 20 and 21 on opposite sides of the support 10, for the purpose of adjusting rod 13 at remote points along its length, bodily, or end to end so as to true up the gage rod 13 into parallel relation with the slicing knife 12. Thus it will be seen that adjustment of the nuts not only serves to true up the gage rod but also to rigidly secure the gage rod in an adjusted position. Rod 14 is provided with means rigidly secured to adjusting bolts 22 and 23, with its proper complement of adjusting nuts, and rod 15 is provided with bolts 24 and 25, rigidly secured thereto, together with its proper complement of adjusting nuts.

In practice, the stock or block indicated at 26, in dotted lines, will be constantly thrust against the gage bars to dispose predetermined marginal portions under or in slicing range of the knife 12. It will be seen that as the knife 12 travels downwardly, on its cutting stroke, that the gage bars will act as gage abutments to the stock during and until the slicing knife has practically sliced off the desired product, there being only a slight distance between the top of the gage bars and the cutting edge of the slicing knife.

In slicing off a product which is intended to be of uniform thickness, such as a veneer or box side, I find it necessary to only use gage rods 14 and 15, or in other words, the outermost rods. For this class of work I therefore adjust the central rod 13 rearwardly, bodily, so that it will be out of range of the stock 26, as diagrammatically indicated in Fig. 10. I make this adjust-

ment because it is only necessary to maintain the stock 26 in a plane parallel with the plane of reciprocation of the slicing knife and I find two gage rods can perform this function perfectly.

In making shingles, I advance the gage rod 13, which is the central rod, somewhat beyond the outer rods 14, and 15, in a direction toward the knife, so that the central gage rod 13 can act as a fulcrum gage rod. Thus the stock will be thrust against rods 13, and 15 for one cut of the knife, (Fig. 9) to form the shingle butt 27 at the right end of block 26. Upon the next reciprocation of the knife, block 26 will be shifted about gage bar 13 as a fulcrum into abutting relation with gage bar 14 and out of engagement with gage bar 15. This will form the butt end of the shingle opposite to the butt end indicated at 27. Throughout the slicing operation, the block will be alternately shifted in the manner described.

I will next describe a novel feature of my invention which enables me not only to slice off a box splint or veneer of a uniform thickness, in one reciprocation of the slicing knife, but which also enables me to score the stock at opposite ends so that when the box splint or side has been sliced off, it will not only be of the required thickness, but also of the required length, the actual novelty of this feature being claimed as regards not only the scoring devices, separately, but also scoring devices in combination with the slicing knife, and of such a character that they will be retracted on the return stroke by engagement with the stock in such a manner that it will not be necessary to retract the stock at each upward or return stroke of the knife frame in order to permit the scoring knives to pass the stock.

In describing my improved scoring devices I will refer more particularly to Figs. 5, 6, 7 and 8. Each scoring device includes a mounting block or bar 28, which is recessed at 29, so as to fit about three sides of gage support bar 11. An attaching plate 30, secured by screws 31, serves to rigidly anchor the mounting block 28 upon the gage support 11. The upper end of the block 28 is provided with an opening of such transverse dimensions that its lateral walls 32 and 33 will structurely engage a scoring knife, and a score knife supporting bar so as to hold the same in lateral abutting relation, as will presently appear. A scoring knife supporting bar 34 extends into the opening in the block 28 and projects rearwardly therefrom away from the slicing knife 12. The scoring knife supporting bar 34 is mounted in the block 28 by a pivot stud 35. A scoring knife is shown having a shank portion 36 provided with a counter-sunk slot 37 therein. The cutting or scoring portion of the knife is indicated at 38 and the same is provided with a point edge 39 having a cam-shaped stock engaging portion 40. As will be seen more particularly by reference to Fig. 5, this cam portion 40 is adapted to engage the stock 26 so as to retract or tilt the scoring knife in the manner indicated in dotted lines, so that the scoring knife will be able to pass by the stock 26 on the return stroke of the knife frame thereby eliminating the operation of retracting the stock to permit of return stroke of the knife frame. By means of this construction, the stock may be constantly urged toward the gage instead of being reciprocated back out of the way of the knife frame.

I will next describe the manner in which the scoring knife is held to its work under scoring stress so as to take the strain off from the knife retaining or supporting bar 34 and the pivot 35.

As will be seen more particularly by reference to Fig. 8, the block 28 is provided with abutments 41 and 42 on the lower and upper walls of the opening which extends through the block 28. These abutments 41 and 42 extend in opposite directions of a vertical line intersecting the axis of pivot stud 35. The remaining portions of the upper and lower walls of the said opening in block 28, are recessed as indicated at 43 and 44, in such a manner as to permit the knife and the supporting bar 34 to tilt from the position shown in full lines, in Fig. 5, to the position shown in dotted lines in Fig. 5. However, the important feature is that abutments 41 and 42 structurely engage the knife to hold the same in a scoring position under working stress on the downward stroke of the knife frame, and off from the pivot 35. As a means of positively securing the scoring knife to its bar, I provide a counter-sunk bolt 45 which extends through the slot 37 and through a slot 46, in the bar 34, there being a nut 47 to tighten the bore rigidly and clamp the scoring knife to its retaining bar. The slots 37 and 46 permit of adjustment of the knife point 29 so as to score the stock 26 to the required depth. Because of the high speed with which this machine will operate, I consider it important to insure the return of the knife point 39 into a proper scoring position immediately upon passage of the knife points upwardly or beyond the stock 26. Therefore, I provide means which may be in the form of a spring 48, attached to bar 34, at 49, and to block 28 at 50, the spring normally urging the bar 34 and the scoring knife into the position shown in full lines of Fig. 5, with the knife in engagement with the abutments 41 and 42. It will be seen by reference to Fig. 5 that the scoring knives are somewhat in advance of the cutting edge of the slicing knife 12, and therefore the scoring knives will score the stock 24 slightly in advance of the slicing

knife, this feature insuring a sliced off splint or shingle of integral formation and greatly decreasing the danger of splitting the product. The relation of the scoring knives to the cutting knife, transversely, will be clearly seen by reference to Fig. 4, and in Fig. 1 I have dotted in the length of the stock 26 to indicate the relation of the stock with respect to the scoring and slicing knives.

By reason of the fact that the stock is not only sliced off but grooved, so as to produce an article of the legal or required length, I am able to sub-divide the stock in lengths which are only slightly in excess of the length of the product to be formed. This reduces waste. The length of the stock 26, as shown in Fig. 1, is considerably exaggerated with respect to the length which will absolutely be necessary. However, the scoring knives are adjustable lengthwise of gage supporting bar 11 and therefore in some instances the stock may be of the length shown in dotted lines, for an outer adjustment of the scoring knives.

I will next describe a novel protecting feature for protecting the hands of the operator from injury.

Guards 51, which may be formed of open mesh wire netting, are mounted upon the knife frame and are preferably secured to the lateral vertical members 8 and to gage rods 14 and 15. These guards extend downwardly from above the scoring knives sufficiently so that they will be below the top of the table when the knife frame is in a starting or upper position, as more particularly shown in Fig. 3. By reference to Fig. 4, it will be seen that the guards are slightly behind the scoring and slicing knives, from the table, or from the stock, but only slightly so. Now when the stock has been sliced off until it is reduced in size, then there is danger of the operator getting his finger ends beneath the knife and getting them cut off. This screen guard affords protection against projection of the fingers beneath the knife 12, when the stock becomes reduced. It might be possible, because of the location of the screen guard somewhat rearwardly from the knives, to chip or scratch the finger of the operator if the finger was projected too far, but the presence of these guards would prevent amputation. A more important feature however, is that if the finger of the operator were initially projected too far, then downward movement of the guard would strike the finger and this would cause the operator to involuntarily retract his finger prior to injury. This is one of the reasons why I use a rough guard which the foraminated material presents.

I will next describe my improved table for supporting the stock.

My improved table includes a base portion 52 which is preferably rigidly mounted on the shoulders 3, indicated in Figs. 1 and 2. Adjustable on this table base 52 is a surface table portion 53 which is preferably formed of wood. The surface portion 53 is not equal in length to the base portion 52 but is sufficiently short to be adjusted between the uprights 1, as indicated in Fig. 4. Near the ends of the surface portion I recess the top of the same and dispose wearing plates 54 therein. The wearing plates 54 are provided with slots 55 and the surface portion 53 is complementally slotted to provide for projection therethrough of adjusting bolts 56. Adjusting bolts 56 extend downwardly through the base portion 52 and the latter is recessed at 57 to accommodate the bolt heads 58 and prevent the bolts from turning. Nuts 59 are adapted to be turned onto the threaded ends of the bolts 56 to clamp the surface portion 53 in the desired position of adjustment with respect to the slicing plane of operation of the knife 12.

A feeding table of this character has its greatest wearing surface adjacent the knife which reciprocates along the side thereof. It is not feasible to provide a hardened steel table because this would injure the knife in case the knife struck the table. Furthermore, a wood surface table wears down very quickly and therefore I have conceived the idea of providing a wood surface with a grid of soft metal such as babbitt, the babbitt taking the wear and protecting the table and also affording a soft surface which will yield and prevent injury to the knife.

As illustrated, the surface portion 53 is longitudinally and transversely grooved, the longitudinal grooves being indicated at 60, 61, 62, 63 and 64, in Fig. 2. The transverse grooves are clearly indicated in Fig. 4, as of the shape of the grid of babbitt, the babbitt portions being designated by reference numerals. A bar of babbitt 65 lies adjacent the sweep or plane of reciprocation of the knife 12 and presents a surface which will yield and be cut by the knife without injuring the knife. 66 and 66 indicate the end bars of babbitt which are connected by a bar 67 on the outside margin of the surface portion 53. Longitudinal bars of babbitt 68, 69 and 70 extend between the bars 65 and 67 and in the grooves 61, 62 and 63. Transverse bars 71 connect bars 68, 69 and 70 and also the front and rear bars 65 and 67. Thus it will be seen that I groove a grid work of grooves in the surface portion 53 and I provide a complemental grid work of babbitt to fit in said grooves and form a flush feeding surface.

The soft metal serves to take the wear and protect the wood top, and the latter supports the babbitt so that it is not necessary to use as much metal as would be necessary if the entire top were formed of metal. Fur-

thermore, by means of these grooves, the metallic grid work is rigidly held in position.

My invention also includes an improved slicing knife which I will now describe in detail.

The slicing knife 12 is provided with a cutting edge having a straight, and preferably centrally disposed advance entering portion 72, and laterally extending receding cutting portions 73. When the knife enters the stock, this straight advance cutting edge or entrance edge 72 has a somewhat extended engagement with the stock as compared to a pointed edge convergence, and therefore, this straight advance edge entering portion steadies the knife so as not only to prevent the same from springing or cutting out of line, but also, preventing the knife from splitting the wood that is sliced off. In other words, entrance of the knife into the stock, initially, is throughout such a considerable length that the receding portions 73 enter more quickly than would be the case if the receding portions converged to a point. Furthermore, a pointed convergence always dulls quickly and requires frequent sharpening whereas if this initial cutting strain is disposed along a straight advance edge cutting portion the stock will not dull this cutting edge nearly so quickly.

My improved slicing knife also has a novelty feature, which comprises a concave stock face or surface 74 which extends horizontally a distance equal to the length of the cutting edge and which also extends vertically from the cutting edges 72 and 73 upwardly to the butt 76. By reason of this construction, it is not necessary for me to cant the slicing knife from the vertical in order to make it enter the stock and slice off the product. My improved knife, because of this construction, is vertically disposed and reciprocates in a vertical plane. In other words, it reciprocates in a plane at right angles to the plane of support of the stock. By having the slicing knife vertically disposed, it is very much easier to true up the gage means and also the knife, with respect to the supporting table, and it is also easier to true up the gage means with respect to the knife.

The concave portion 74, starting at the cutting edge, causes the cutting edge to wear sharp instead of round, and in sharpening the cutting edge, I can lay the stone on the stock side or face of the knife with the stone bearing at 76 and on the cutting edge, and I will always be sure to sharpen the cutting edge itself instead of wearing the stone out against the side of the knife.

In practice, I employ a bevel 77, of about one sixteenth of an inch, the knife being thickened at 78, gradually to the required thickness.

It is believed that the advantages and utility of my invention will be fully understood from the foregoing description, and while I have herein shown and described one specific form of my invention, I do not wish to be limited thereto except for such limitations as the claims may import.

I claim:—

1. In a splint, veneer or shingle forming machine, a table for supporting the stock to be sliced, a main reciprocating knife for slicing off from the stock a splint of the desired thickness, and knives moving with said main knife for scoring the stock to form a splint cut by said main knife of the desired length during the slicing stroke of said main knife, said scoring knives being movably mounted for retraction on the return stroke on engagement of said scoring knives with the stock, whereby feed pressure may be constantly applied to advance the stock toward said main knife, substantially as described.

2. In a splint, veneer or shingle forming machine, a table for the stock to be sliced, a main reciprocating knife for slicing off from the stock a splint of the desired thickness, and knives for scoring the stock to form a splint cut by said main knife of the desired length during the slicing stroke of said main knife, said scoring knives being pivotally mounted to permit of retraction of said scoring knives on engagement with the stock on the return stroke, whereby feeding pressure may be constantly applied to advance the stock toward said main knife, substantially as described.

3. In a splint, veneer or shingle forming machine, a table for supporting the stock to be sliced, a main reciprocating knife for slicing off from the stock a splint of the desired thickness and knives for scoring the stock to form a splint cut by said main knife of the desired length during the slicing stroke of said main knife, each scoring knife having mounting means pivotally supporting its knife and being provided with an abutment for holding the knife to its work under scoring action and also having a recess to permit of retraction of said knife on engagement of the knife with the stock during the return stroke, whereby feeding pressure may be constantly applied to advance the stock toward said main knife, substantially as described.

4. In a splint, veneer or shingle forming machine, a table for supporting the stock to be sliced, a main reciprocating knife for slicing off from the stock a splint of the desired thickness, knives for scoring the stock to form a splint cut by said main knife of the desired length during the slicing stroke of said main knife, each scoring knife having a holder pivotally supporting its knife and being provided with an abut-

ment for holding its knife against pivotal movement under scoring action and provided with a recess to permit of retraction of its knife on engagement with the stock during the return stroke, and a spring for each holder normally acting to return the knife into engagement with its abutment, substantially as described.

5. In a splint, veneer or shingle making machine, a table for supporting the stock, a reciprocating knife frame, a stock scoring device mounted on said frame and including a mounting block having an opening therethrough provided with a knife abutment and a knife releasing recess, a knife bar extending into said opening and being pivoted to said block, a scoring knife extending through said opening and adapted for rocking movement into and out of contact with said abutment and extending along side of said knife bar, means securing said knife to said knife bar, and means engaging said knife bar to normally retract said knife against said abutment, substantially as described.

6. In a scoring knife device, a mounting block having an opening therethrough with a knife abutment and a knife releasing recess, a knife bar pivoted to said block and extending into said opening, a scoring knife fixed to said bar and extending through said opening and adapted for rocking movement into and out of contact with said abutment, substantially as described.

7. In a splint, veneer or shingle making machine, a table for the stock, a vertically reciprocating knife frame provided with a knife for slicing the stock, a scoring device mounted on said frame and including a mounting block provided with an abutment, a knife bar pivoted to said block, a scoring knife secured to said knife bar and adapted for co-action with said abutment to hold said scoring knife to its work during scoring reciprocation of the frame, and means normally acting to hold said knife in engagement with said abutment, substantially as described.

8. In a wood scoring device of the class described, a mounting block provided with knife abutment, a knife bar pivoted to said block, a scoring knife secured to said knife bar and adapted for engagement with said abutment to thereby hold said knife to its work during scoring reciprocation, and means normally holding said knife bar in engagement with said abutment, substantially as described.

9. In a wood scoring device, a supporting block, a scoring knife, a knife supporting bar, an opening in said supporting block having lateral walls spaced to hold said knife and bar in close lateral relation, said knife and supporting bar being pivotally mounted centrally in said block opening, said scoring knife extending through said opening and being rigidly secured to said bar, the upper and lower walls of said opening having flat abutment portions on opposite sides of a line intersecting the axis of said pivot of said bar for holding said knife against rocking movement when said knife is under scoring stress, said upper and lower walls having receding portions contiguous with and extending in opposite directions from said abutment portions whereby said knife may rock from a scoring position on return stroke of said knife, substantially as described.

10. In a wood splint, veneer or shingle making machine, a table for supporting the stock, a reciprocating knife frame, a supporting block mounted on said knife frame, a scoring knife, a knife supporting bar, said block having an opening provided with lateral walls spaced to hold said knife and bar in close lateral relation, said knife supporting bar being pivotally mounted centrally in said opening, said scoring knife extending through said opening and being rigidly secured to said bar, the upper and lower walls of said opening having flat abutment portions on opposite sides of a line intersecting the axis of said pivot for holding said knife against rocking movement under scoring stress, said upper and lower walls having receding portions extending in opposite directions from said abutting portions for permitting rocking movement of said knife on the return stroke of said frame, substantially as described.

11. In combination, a reciprocating knife frame provided with a slicing knife, a table for the stock having a fixed base portion, a wood surface portion adjustably mounted on said base portion for movement toward or from said knife, the top of said surface portion having a grid-work of grooves formed therein, and a grid of Babbitt or like soft metal fitting in said grooves and being flush with the top of said surface portion, substantially as described.

12. In a wood slicing machine, a table for the stock, a reciprocating knife frame movable past said table, and a knife carried by said frame and having a stock side concave from its cutting edge toward its base, substantially as described.

13. In a wood slicing machine, a table for the stock, a reciprocating knife frame movable past said table, and a knife on said frame having a cutting edge provided with a straight advance entering portion disposed centrally of the length of said cutting edge, the remaining portions of the length of said cutting edge being inclined rearwardly from said advanced portion, substantially as described.

14. In a wood slicing machine, a table for supporting the stock, a slicing knife

having a cutting edge and being concave on its stock side from its cutting edge toward its butt, whereby the knife may be reciprocated at a plane at right angles to the surface of the table, substantially as described.

15. In a scoring knife device, a reciprocating mounting block, a scoring knife, means pivotally mounting said knife on said block in a manner permitting movement of said knife out of the path of the work on the return stroke of said block, and said block having an abutment for holding said knife to its work on the scoring stroke of said block, substantially as described.

In testimony that I claim the foregoing as my own, I hereby affix my signature.

SAMUEL CARLIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."