

(No Model.)

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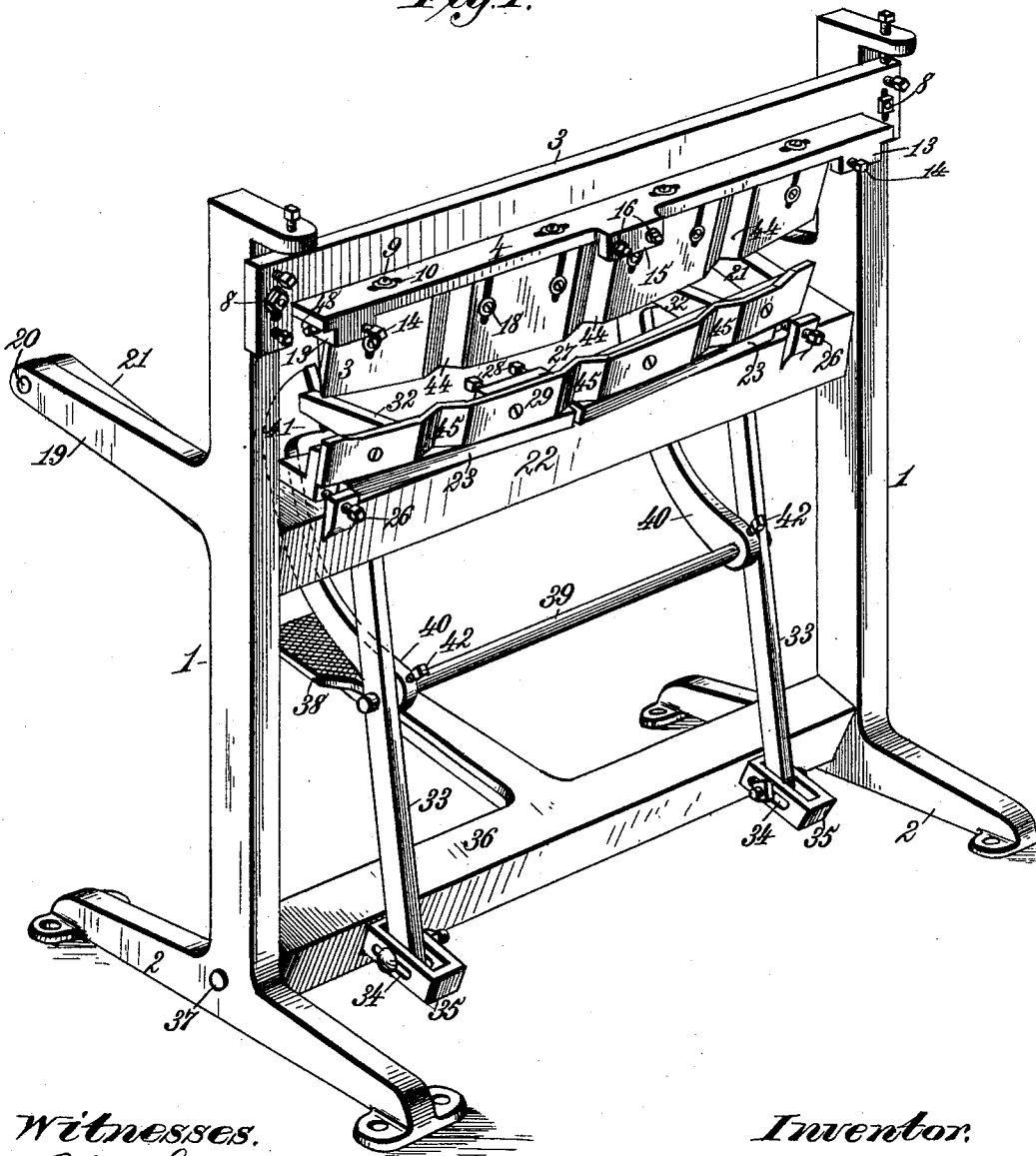
C. W. RICH.

STAVE TRIMMING OR JOINTING MACHINE.

No. 484,460.

Patented Oct. 18, 1892.

Fig. 1.



Witnesses.
Robert G. Pratt.
J. A. Rutherford.

Inventor,
Charles W. Rich.
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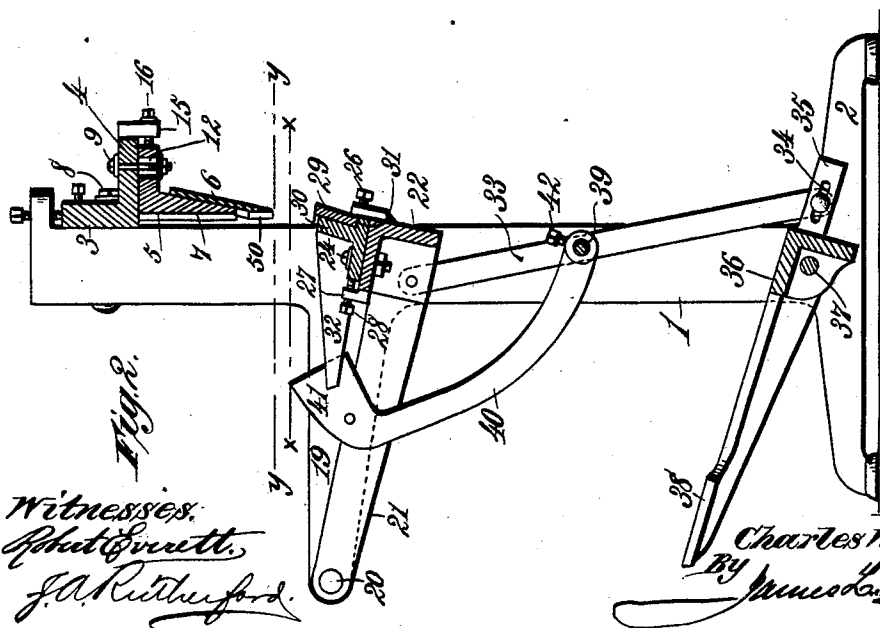
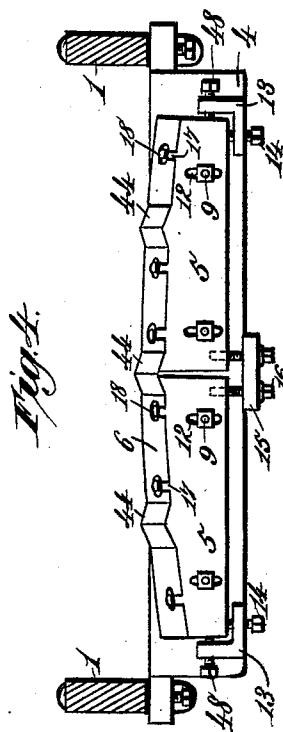
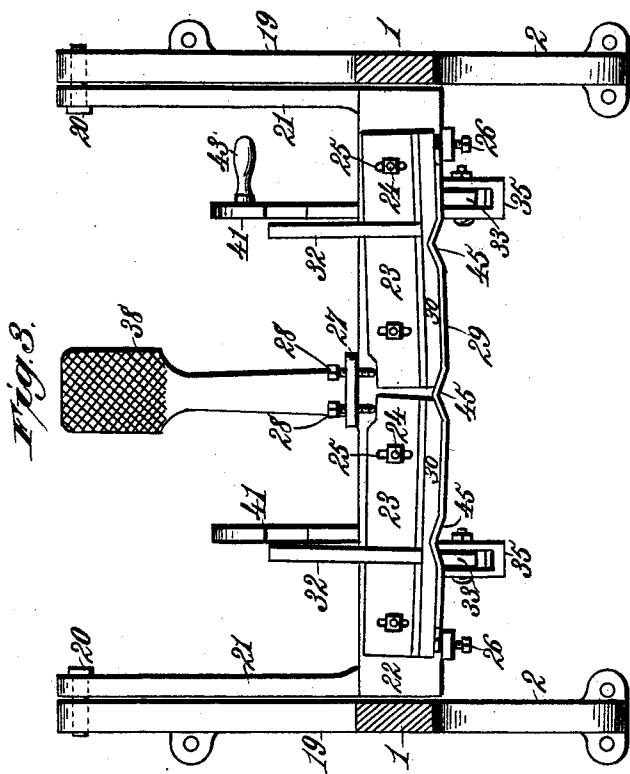
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3 Sheets—Sheet 2.

C. W. RICH.
STAVE TRIMMING OR JOINTING MACHINE.

No. 484,460.

Patented Oct. 18, 1892.



Witnesses:
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(No Model.)

3 Sheets—Sheet 3.

C. W. RICH.

STAVE TRIMMING OR JOINTING MACHINE.

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Fig. 5.

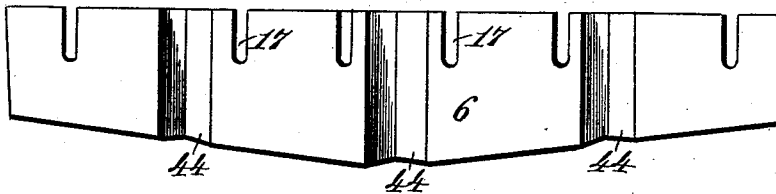


Fig. 6.

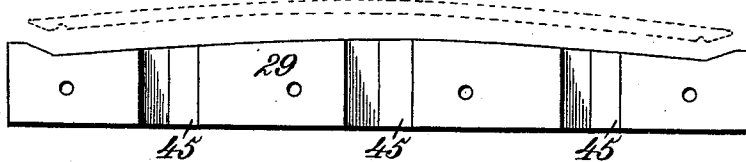


Fig. 7.

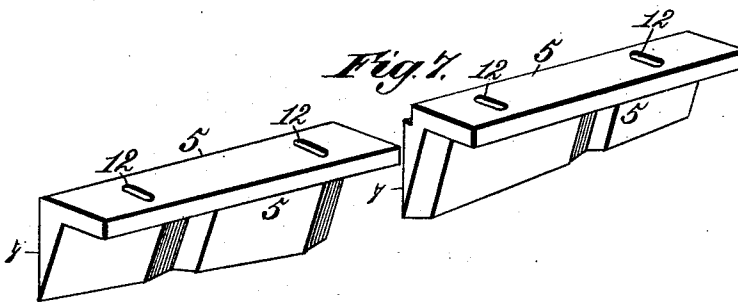


Fig. 8.

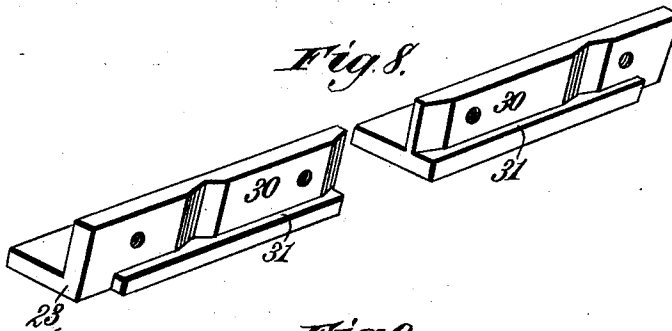
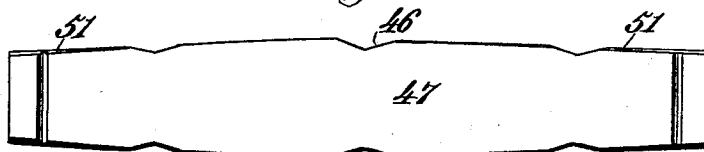


Fig. 9.



Witnesses.

Robert G. Smith,

J. A. Rutledge,

Inventor.

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By

James L. Davis,
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UNITED STATES PATENT OFFICE.

CHARLES W. RICH, OF SUMMERTOWN, ASSIGNOR OF ONE-HALF TO LUTHER L. FRIERSON, OF MOUNT PLEASANT, TENNESSEE.

STAVE TRIMMING OR JOINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 484,460, dated October 18, 1892.

Application filed August 6, 1891. Serial No. 401,925. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WILLIS RICH, a citizen of the United States, residing at Summertown, in the county of Lawrence and State of Tennessee, have invented new and useful Improvements in Stave Trimming or Jointing Machines, of which the following is a specification.

The object of my invention is to provide novel means for simultaneously trimming or jointing and recessing or notching the edges of staves for the purpose of more rapidly producing the staves and materially economizing the manufacture of ventilating barrels or vessels employed for transporting early apples, new potatoes, and other fruits or vegetables.

The invention also has for its object to provide a new and improved stave trimming or jointing machine whereby the curvature at the edges of the staves can be varied to increase or diminish the bilge of the barrel or vessel, and to so form or shape the edges that when they are assembled they will fit closely together and produce a nice, smooth, and neat barrel.

To accomplish all these objects, my invention involves the features of construction and the combination or arrangement of devices hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a perspective view of a stave trimming or jointing machine constructed in accordance with my invention. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a horizontal sectional view taken on the line $x x$, Fig. 2, looking downward. Fig. 4 is a similar view taken on the line $y y$, Fig. 2, looking upward. Fig. 5 is a side elevation of the stave trimming and recessing cutter or knife. Fig. 6 is a similar view of the cutting-rest for supporting the stave while being trimmed and recessed. Fig. 7 is a detail perspective view of the adjustable plates for supporting and springing the stave-trimming knife into a greater or less longitudinal curvature. Fig. 8 is a similar view of the adjustable plates for similarly supporting and

springing the cutting-rest, and Fig. 9 is a plan view of a barrel-stave produced by my improved machine.

In order to enable those skilled in the art to make and use my invention I will now describe the same in detail, referring to the drawings wherein—

The numerals 1 indicate the end frames or standards of the machine, which are provided with suitable feet 2 for rigidly securing them in position. The upper ends of the frames or standards are connected by a horizontal knife-carrying bar 3, preferably composed of an angle-iron, for the purpose of providing the laterally-projecting flange 4, to which are adjustably connected the angular plates 5, which carry the stave trimming or jointing cutter or knife 6. The plates 5, as shown, are composed of angle-irons and the rear surfaces of the vertical flanges 7 of these angle-irons are beveled or inclined to provide the proper seat for the metallic knife or cutter 6, which is composed, preferably, of a continuous piece of properly-tempered spring-steel suitable for the conditions required. The extremities of the horizontal knife-carrying bar 3 are connected with the end frames or standards by suitable adjusting-bolts 8 in such manner that either or both ends of the bar can be raised or lowered as occasion may demand.

The horizontal flanges of the angular plates 5 are secured to the horizontal flange 4 of the cutter-carrying bar 3 through the medium of clamping-bolts 9, which extend through slots 10 in the flange 4 and through slots 12 in the plates 5, said slots 10 and 12 being arranged at right angles to each other, so that the plates 5 can be adjusted lengthwise and transversely with relation to the cutter-carrying bar. The flange 4 is provided at each extremity with a pendent lug or projecting part 13, having a set-screw 14, to bear against one extremity of each adjusting-plate 5, and centrally between its extremities the flange 4 is provided with a pendent bracket 15, provided with a pair of set-bolts 16, which respectively bear against the inner adjacent ends of the adjusting-plates 5. The stave trimming or joint-

ing knife 6 is provided with a series of vertical slots 17, through which pass clamping-screws 18 for attaching the cutter or knife to the adjusting-plates 5, while rendering the
 5 cutter or knife susceptible of vertical adjustment relatively to said adjusting-plates. The object of this construction and arrangement is to enable the cutter or knife to be sprung longitudinally into a curve of greater or less
 10 radius for regulating the bilge of the barrel to be produced.

It will be obvious that if the set-screws 16 be adjusted to move the adjoining extremities of the plates 5 in a direction toward the
 15 operator the leverage exerted by the said plates will spring the cutter or knife longitudinally, and by adjusting the set-screws to a greater or less extent the cutter or knife is sprung longitudinally into a curve of greater
 20 or less radius. The set-screws 14, which act against the outer ends of the plates 5, assist in adjusting the sections for springing the cutter or knife into a longitudinally-curved condition.

The end frames or standards 1 of the machine-frame are provided with horizontally-projecting bars 19, to the outer extremities of which are pivoted, as at 20, the table-supporting arms 21, carrying at their rear end portions the table 22, which, as here shown, is angular in cross-section for the purpose of increasing its strength, while making it light in weight. To the upper side of the table 22 are applied a pair of adjusting-plates 23, composed
 35 of angle-irons having the horizontal flanges connected with the table by clamping-bolts 24, which pass through suitable slots 25 in the plates 23. The table is provided at the rear side of each end with a set-screw 26, adapted
 40 to bear against the outer extremity of one of the adjusting-plates 23, and centrally between its extremities the table is provided with an upwardly-projecting bracket 27, having a pair of set-screws 28, bearing, respectively, against
 45 the inner adjacent extremities of the adjusting-plates 23, all in such manner that the said plates 23 can be adjusted exactly the same as the adjusting-plates 5 for the purpose of springing an elastic cutting-rest 29 longitudinally into a curve of greater or less radius, according to the longitudinal curve to which the trimming or jointing knife 6 has been sprung. The cutting-rest 29 is composed of a plate of spring-steel to render it susceptible of being
 55 sprung longitudinally, and it is attached to the vertical flanges 30 of the adjusting-plates 23 through the medium of screws or other fastening devices. The lower portions or bases of the adjusting-plates 23 are provided with
 60 ledges or shoulders 31 to serve as abutments for the cutting-rest 29, thereby enabling the latter to resist the strains incident to the trimming or jointing operation.

The adjusting-plates 23 carry a pair of rest-bars 32, which serve to support the staves as

they are adjusted upon the cutting-rest 29, as will more fully hereinafter appear.

In the construction described and shown the series of plates 5 extend longitudinally along the elastic knife 6 and constitute a
 70 substantially continuous support along the length thereof, whereby the knife cannot twist and is rendered strong and durable and susceptible of practicably effecting the work to be performed. The plates 23 also extend
 75 longitudinally along the elastic cutting-rest 29 and constitute a substantially-continuous support for the same, while permitting such rest to be sprung into curves of different radii.

The table 22 is adapted to oscillate in the arc of a circle and is connected to the upper extremities of rods or links 33, having their lower extremities adjustably connected with the slotted portions 34 of arms 35, projecting
 85 rearwardly from a rocking treadle-bar 36, having its extremities pivoted to the end frames or standards, as at 37. The rocking treadle-bar is provided with a foot treadle or lever 38, which can be depressed for the purpose of raising the table 22 to effect the trimming or jointing of the staves by the co-operating action of the trimming cutter or knife 6 and the cutting-rest 29.

The connecting rods or links 33 are provided with a rock-shaft 39, on which are mounted the lower extremities of a pair of feed-arms 40, having their upper extremities provided with suitably-shaped heads 41, arranged in such relation to the stave-rests 32
 100 that when the feed-arms are swung in the proper direction a stave supported by the stave-rests 32 will be fed or advanced into proper position upon the cutting-rest 29, so that when the table is elevated the trimming or jointing knife will accurately trim the edge of the stave and produce a longitudinal curvature on such edge corresponding to the longitudinal curvature imparted to the trimming cutter or knife and cutting-rest.

The feed-arms 40 can be adjusted on the rock-shaft 39 by means of set-screws 42 for the purpose of adjusting the heads 41 of the feed-arms into correct operating position, as occasion may require. By mounting the feed-arms 40 upon the rock-shaft 39, carried by the connecting rods or links 33 of the treadle mechanism, the two feed-arms are simultaneously moved by swinging one of them through the medium of a handle 43, and such feed-arms rise and fall with the connecting rods or links as they move vertically to oscillate the table 22.

The slotted portions 34 of the arms 35 on the rocking treadle-bar 36 enable the stroke
 125 of the table to be varied by adjusting the lower extremities of the connecting rods or links 33 along the arms 35. By adjusting the lower extremities of the connecting rods or links toward the rocking treadle-bar 36 the
 130

stroke of the table will be diminished, while by adjusting the lower extremities of the connecting rods or links away from the rocking treadle-bar the stroke of the table will be increased.

The shape of the cutting-edge of the cutter or knife 6 is clearly shown in Fig. 5, and it is such that the central portion of the cutter or knife commences the cutting operation, and consequently a shear cut is produced from the center toward each end.

For the purpose of producing ventilating recesses or notches in the edges of the stave simultaneously with the trimming or jointing action of the cutter or knife I provide the latter with a series of laterally-projecting cutting portions 44, which interrupt the continuity of the trimming or jointing cutting-edge and fulfill the conditions required to form recesses or notches in the edges of the staves simultaneously with the trimming or jointing thereof. The cutting-rest 29 is also provided with similarly-shaped cavities or recesses 45, adapted to receive the laterally-projecting cutting portions 44 of the cutter or knife 6.

The shape or configuration of the laterally-projecting cutting portions 44 and of the cavities or recesses 45 may be largely varied without altering the character of my invention, it only being essential to so construct these parts that when the cutter or knife acts to trim or joint the edge of the stave it will simultaneously therewith produce recesses or notches 46 in the edge of the stave 47, as clearly shown by Fig. 9, in such manner that when the staves are assembled and secured the recesses or notches in the edges of one stave register or match with the recesses or notches in the contiguous staves, and a barrel having ventilating-orifices is produced.

The number of laterally-projecting cutting-edges 44 and cavities 45 can be varied, according to the number of recesses or notches it is desired to produce in the edges of the staves.

I have indicated the laterally-projecting cutting portions 44 as angular or approximately-V-shaped and the cavities or recesses 45 correspondingly formed, as this is a desirable construction for the purpose of producing the ventilating-orifices.

The recesses or cavities 45 are provided in the cutting-rest by shaping the latter with laterally-projecting portions exactly the same as the laterally-projecting portions of the cutter or knife 6; but I do not confine myself to this specific manner of producing the recesses or cavities 45 in the cutting-rest.

To produce perfect work, it is essential that the cutting-rest 29 move close to the cutter or knife 6, and this is rendered possible by the adjusting devices described and shown for enabling the several parts to be properly adjusted in accordance with the conditions required.

The cutter or knife 6 is adapted to be

slightly adjusted lengthwise through the medium of set-bolts 48, engaging the brackets 13, secured to the flange 4 of the knife-carrying bar 3. The object of this is to adjust the knife slightly in a longitudinal direction to accurately register its laterally-projecting cutting portions 44 with the cavities or recesses 45 of the cutting-rest 29.

It will be observed that the beveled or inclined sides of the flanges 7 on the adjusting-plates 5 are at the rear of the machine and the beveled edge 50 of the cutter or knife 6 is presented toward the front side of the machine. By this arrangement I obtain better results, because the flanges 7 of the adjusting-plates 5 can project down in proximity to the edge of the cutter or knife and close to the top portion of the beveled edge 50, thereby affording greater support to the thin cutter or knife and rendering it less liable to spring upon the cutting-rest 29 as the latter moves past such cutting-edge. The action of the wood while being cut tends to pull the cutter or knife forward, and this would spring the cutter or knife upon the cutting-rest 29, were such cutter or knife not braced and supported by the flanges 7 of the adjusting-sections 5, as hereinbefore explained.

The cutter or knife 6 and the cutting-rest 29 can be conveniently detached for the purpose of substituting a straight-edged cutter and a straight-edged cutting-rest, if it be desired to use the machine without producing ventilating recesses or notches in the edges of the trimmed staves.

By providing a table and a cutting-rest which move in the arc of a circle and constructing the stave trimming or jointing cutter or knife with reverse inclined cutting-edges, I am enabled to so cut the staves that they have each edge continuously increasing in angle of inclination from the center toward each end, as indicated at 51, Fig. 9. This angle is that produced by the edge of the stave relatively to the face or side thereof, such edge being beveled instead of at right angles to the face or side of the stave, as heretofore, and this bevel increases in angle of inclination from the center to the end of the stave. The continuously-increasing angles 51 referred to result from the fact that the cutting-rest 29 moves in the arc of a circle and the cutter or knife 6 commences the cutting action at the center of the length of the stave. By this means the staves fit more closely together when assembled and secured and nicer, smoother, and neater joints are provided.

Having thus described my invention, what I claim is—

1. The combination, with a stave-cutting rest, of a knife-bar, a jointing-knife composed of a single continuous strip of elastic metal, a series of independently-adjustable plates carried by and bodily movable back and forth on the knife-bar and secured to the elastic

knife to constitute a substantially-continuous support therefor along its length, and adjusting devices carried by the knife-bar and acting upon the adjustable plates to independently adjust them and spring the knife into curves of greater or less radii, substantially as described.

2. The combination of an oscillating table having an adjustable elastic cutting-rest, a knife-bar which is supported in a fixed position during the stave jointing or trimming operation, a series of independently-adjustable plates suspended from and bodily movable back and forth on the knife-bar and secured to the elastic knife to constitute a substantially-continuous support for the same along its length, and adjusting devices carried by the knife-bar and acting upon the adjustable plates to independently adjust them and spring the knife into curves of greater or less radii, substantially as described.

3. The combination, with a stave-cutting rest, of a knife-bar, a jointing-knife composed of a single continuous strip of elastic metal having a series of laterally-projecting cutting portions at its cutting-edge, a series of independently-adjustable plates carried by and bodily movable back and forth on the knife-bar and secured to the elastic knife to constitute a substantially-continuous support therefor along its length, and adjusting devices carried by the knife-bar and acting upon the adjustable plates to independently adjust them and spring the knife into curves of greater or less radii, substantially as described.

4. The combination of an oscillatory table, an elastic cutting-rest, a series of plates adjustable on the table and secured to the elastic cutting-rest to constitute a substantially-continuous support therefor along its length, a knife-bar, an elastic trimming or jointing knife, a series of independently-adjustable plates carried by and bodily movable back and forth on the knife-bar and secured to the elastic knife to constitute a substantially-continuous support therefor along its length, and adjusting devices carried by the knife-bar and acting upon the adjustable plates to independently adjust them and spring the knife into curves of greater or less radii, substantially as described.

5. The combination of the end frames or standards, a knife-bar which stands stationary during the stave trimming or jointing operation, an elastic trimming or jointing knife, a series of angular plates comprising horizontal flanges adjustably secured to the knife-bar and vertical flanges to which the elastic knife is attached, a series of set-screws carried by the knife-bar and acting upon the angular plates to independently adjust them and spring the knife into curves of greater or less radii, a cutting-rest, and means for adjusting the cutting-rest into longitudinal

curves of different radii, substantially as described.

6. The combination, with a knife-bar and an elastic stave-jointing knife, of a series of independent adjustable angular plates suspended from and movable back and forth on the knife-bar and connected with the elastic jointing-knife, devices carried by the knife-bar and acting against the angular sections to independently adjust them and spring the knife into curves of greater or less radii, a table, a series of adjustable plates mounted on the table, an elastic cutting-rest secured to and solely supported by the adjustable plates, and devices carried by the table and acting on said plates to independently adjust them and spring the cutting-rest into curves of greater or less radii, substantially as described.

7. The combination, in a stave trimming or jointing machine, of a knife-bar, an elastic trimming or jointing knife, a series of independently-adjustable plates slidable back and forth on the knife-bar connected with the elastic knife and constituting a substantially-continuous support for the latter along its length, and set-screws carried by the knife-bar and acting against the opposite end portions of the plates for independently adjusting them and springing the knife into curves of greater or less radii, substantially as described.

8. The combination, in a stave trimming or jointing machine, of a stave-cutting rest, a knife-bar, a pair of knife-supports carried by and adjustable lengthwise and transversely with relation to the knife-bar, and a stave-jointing knife composed of a single continuous strip of elastic metal secured to the lengthwise and transversely-adjustable knife-supports, substantially as described.

9. The combination, in a stave trimming or jointing machine, of a stave-cutting rest, a knife-bar, a pair of knife-supporting plates carried by and movable lengthwise and transversely with relation to the knife-bar, a stave-jointing knife composed of a single continuous strip of elastic metal secured to the lengthwise and transversely-adjustable knife-supporting plates, and a series of set-screws carried by the knife-bar for adjusting the knife-supporting plates lengthwise and transversely with relation thereto, substantially as described.

10. The combination, in a stave trimming or jointing machine, of a knife-bar, an elastic jointing-knife, knife-supports composed of angular plates having horizontal flanges movably secured to the knife-bar and vertical flanges to which the elastic jointing-knife is attached, and devices carried by the knife-bar for adjusting the knife-supports to spring the jointing-knife into longitudinal curves of different radii, substantially as described.

11. The combination, in a stave trimming or jointing machine, of a knife-bar, a trimming

or jointing knife, an oscillatory table having
a cutting-rest, a rocking treadle-bar having
rearwardly-projecting arms, rods or links piv-
otally connected at their upper ends with the
5 table and adjustable at their lower ends along
the rearwardly-projecting arms of the rock-
ing treadle-bar, a rock-shaft journaled to the
said connecting rods or links, and a pair of
stave-feeding arms rigidly secured to the rock-
10 shaft, so that the latter constitutes a pivotal

support for moving both arms in unison and
causing them to rise and fall with the oscil-
latory table, substantially as described.

In testimony whereof I have hereunto set
my hand and affixed my seal in presence of 15
two subscribing witnesses.

CHARLES W. RICH. [L. S.]

Witnesses:

LUTHER L. FRIERSON,
C. A. STOCKWELL.