(No Model.)

G. W. PACKER.

STAVE JOINTING MACHINE.

No. 347,371. Patented Aug. 17, 1886.

Fig. 1.

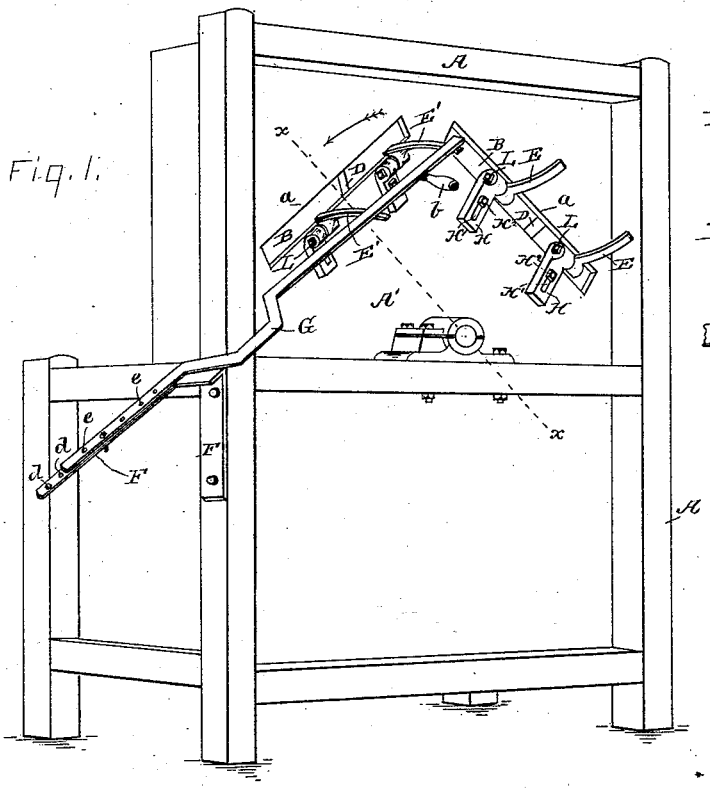


Fig. 2.

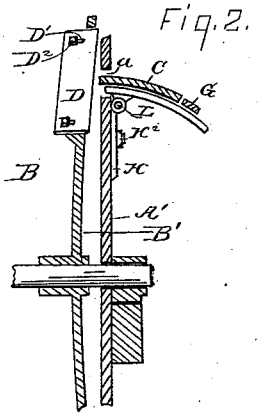
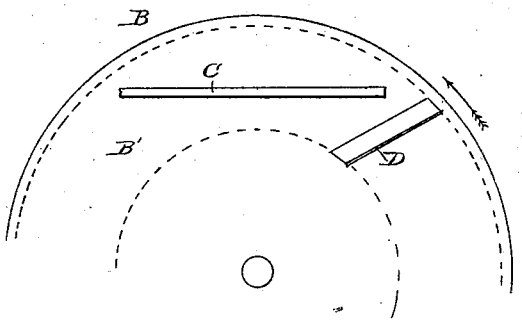


Fig. 3.



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GEORGE W. PACKER, OF ROCK FALLS, ILLINOIS.

STAVE-JOINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 347,371, dated August 17, 1886.

Application filed January 28, 1886. Serial No. 190,032. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. PACKER, a citizen of the United States, residing at Rock Falls, in the county of Whiteside and State of Illinois, have invented certain new and useful Improvements in Stave-Jointing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention has reference to stave-jointing machines, and has special reference to certain mechanism to secure the necessary variance in the taper and bilge of the staves of differently shaped and sized casks; second, to insure a uniform and equal taper to both sides of the same stave, and, third, to provide a degree of taper for each stave in proportion to the width of the latter.

Heretofore in jointing-machines no provision has been made for properly varying the taper on staves of different widths, but the most that could be accomplished was to straighten the sides of the staves, leaving the latter with such taper as they might have as they came from the saw. It is well known that the staves in each cask are of variant widths, and that unless the sides of each stave have a taper in proportion to the width of such staves it is impracticable to make a perfectly-round cask.

To give to each stave a taper in proportion to its width, and thus secure a perfectly-round cask, is one of the objects of my invention. It is also well understood that the staves are required to be slightly convex at their central portion, so that the transverse diameter of the cask may be the greatest near its longitudinal center, whereby the hoops compress as driven from each end toward the center, and the tightness of such center is assured without being immediately bound with hoops. This central lateral enlargement of the cask is termed the "bilge" or "bulge," and varies in different species and sizes of casks. It is obtained by making the edges of each stave convex at or near its longitudinal center. Another of the elements of my invention is a provision for securing any degree of such central convexity, and thus obtaining any desired bulge.

In the drawings, Figure 1 is the perspective of a machine embodying my invention. Fig. 2 is a diagonal section thereof in the line *x x* of Fig. 1. Fig. 3 is a partial side elevation of the operating-face of the wheel B, which carries the cutting-blades. In Fig. 3 is shown a stave, C, to exhibit the track in reference thereto of the blade or knife D in the rotation of the wheel B.

Referring first to the mechanism for securing a proper, uniform, and proportional taper to each side of all the staves, A is the frame of the machine, in which is suitably journaled the wheel B, adapted to be driven at a great velocity, that adopted in my machine being five hundred revolutions per minute. On the side B′ of the wheel B adjacent to the operator are affixed four equidistant knives or blades, D, which, in the rotation of the wheel B, pass in curved lines directly behind the slots *a*, formed diagonally in the side A′ of the frame A. The blades D project sufficiently beyond the face or side of the wheel B to operate like a plane-bit on the edges of the staves. The wheel B rotates as closely to the side A′ as the projection of the cutting-edges of the blades D will permit. A pair of arms, E and E′, are attached to the side A′ beneath the slots *a*, forming a bench or support for the staves in the process of jointing. The arms E are concaved on their upper surface, and on them the stave is placed with its concave side upward. The arms E′ are slightly convex on their upper surface, and on them the stave is placed with its convex side upward. In both cases the stave is pushed laterally into the slot *a*, its front end resting against the front end of such slot, and held against the wheel B until so far planed on the edge that the stave rests its entire length against the face of the wheel B. In moving the stave from the arms E to the arms E′ the stave is kept the same end forward, and merely reversed laterally, so that both edges thereof are planed.

F is an arm suitably attached to the frame A, so as to be in line with the face B′ of the wheel B, and about the same declination as the slot *a*.

G is a bar pivoted at its lower end on the arm F, and resting at its upper end on the arms E'. The bar G, for convenience, is provided with the handle *b*, and is used to press against the outside of the stave in the secondary part of the process of planing the edges of the latter.

The arm F is provided with a series of holes, *d*, and the bar G with a like series of holes, *e*, for lineal adjustment of the one upon the other, to adapt such bar for use with casks of different diameter or different taper. The stem of the arm F is bent laterally, so as to attach more firmly to the corner-post of the frame A, and the bar G is also crooked laterally, to enable it to pass on the outside of such post; but the series of holes *d* in the arm F is in the direct line of the face B' of the wheel B, and of course the pivotal point of the bar G (which is some one of the holes in the series *d*) is always in line of the direct prolongation of the face B' of the wheel B.

That portion of the bar G which is pressed against the outer edge of the stave, (when the latter rests on the arms E',) if such bar G were pressed against the face B' of the wheel B, would be parallel with such face B'. That portion of the bar G which extends along the outer edge of the stave has a straight inner edge, and therefore, whatever the position of such bar G upon the arms E', such straight portion of said bar G has the same angle of divergence from the pivotal point of such bar as has the face B' of the wheel B. It then results that when a stave is first straightened on its inner edge upon the arms E, and then reversed laterally on the arms E' and its straightened side placed against the bar G, and the stave is pressed, by means of the bar G, against the face B' of the wheel B until such inner edge is straightened and parallel with such face, each side of such stave will have the same taper, which taper, if prolonged, would converge to a common focus at the pivotal point of the bar G. The quantity of this convergence, and therefore the degree of taper required in the cask, is regulated and attained by shifting the pivotal point of the bar G to or from the machine by changing the bolt *f*, which connects the bar G and arm F, into different holes *d* and *e* in such bar and arm. It is obvious that the farther the pivotal point of the bar G is removed from the machine the less will be the degree of taper in the cask. The great advantage of this part of my invention lies in the fact that not only will both sides of each stave have the same degree of taper, but each stave will be tapered in proportion to its width, and that the line of taper of both sides of all the staves, whatever their variance in width, will converge to a common focus—to wit, the pivotal point of the bar G. Thus absolute and perfect roundness of the cask is unerringly attained.

The following constitutes the mechanism for regulating the quantum of bulge: The face B' of the wheel B slopes slightly toward the side A' of the frame A from the inner end of the knives D to the outer end of such knives, Fig. 2, and the knives D, by means of transverse slots D' therein, and bolts D^2, passing through such slots, and a flange on the inner face of the wheel B, have their cutting-edges kept in line or parallel with the radial slope of the face B' of the wheel B. Therefore the (radially) outer end of the knife D is slightly nearer the slot *a* than the opposite or inner end of such knife. The knives D having an orbital or circular movement, and the stave being held at a certain angle diagonal to such movement, different portions of the cutting-edge of the knife come in contact with different portions of the edge of the stave, and to increase the bulge it is only necessary to hold the stave in such relation to the path of the knives D that the central portion of such stave shall be planed by the inner end of the knife D, while the outer portions of the stave shall be planed by the outer ends of such knife, and vice versa. With the stave in the position shown in Fig. 3, it is obvious that the central portion of the stave C will be planed by the inner end of the knife D, while the extremities of such stave will be planed by the outer portion of such knife, and the outer end of the knife D being nearer the slot, the central portion of the stave will be slightly convex. (It will be noticed that the outer end of the knife D at one part of its revolution planes one end of the stave C, and at another part of its revolution planes the other end of such stave.)

The slots *a* are somewhat wider than the thickness of the staves. The arms E and E' are each separately seated in a bracket, H, attached adjustably below such slots to the side A' of the frame A. Longitudinal slots H' are formed in the brackets H, and the latter attached, respectively, by bolts H^2, having their heads countersunk in the inner side of the side A' and extending outwardly through such slots H'. By moving the brackets H up or down, either jointly or severally, the angle of the stave to the path of the knives D can be adjusted so as to obtain for the staves the desired degree of bulge. The arms E and E' are attached to the brackets H by means of bolts L, passed transversely through both bracket and arm and fastened with a nut. The bolt L can be used as a set-screw to give the arms E and E' any desired angle in reference to the face B' of the wheel B, and thus the bevel on the edge of the staves be regulated as desired. The smaller the cask in its transverse diameter the greater will be the bevel required.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. The combination of the wheel B, provided with sloping face B', the knives D, seated on the face B', the supporting-frame having the side A', provided with slot *a*, and

placed adjacent to the face B′ of the wheel, and in such relation thereto that the knives D pass behind the slots *a*, brackets H, adjustably attached to the outside of the side A′, below the slot *a*, and arms E and E′, adjustably supported on brackets H, and sustaining the stave at different angles in the slot *a*, substantially as shown, and for the purpose described.

2. The combination of the wheel B, knife D, seated on the side of such wheel, side A′, provided with the slot *a*, arms or stave-supports E′, arm F, attached to the frame A, and bar G, pivoted to the arm F, in line with the working-face of the wheel B, substantially as shown, and for the purpose specified.

3. The combination of the frame A, provided with side A′ and slot *a*, the wheel B, provided with sloping face B′, adjacent to the inner face of the side A′, knives D, seated on the face B′, so as to have an orbital movement behind the slot *a*, and arms E and E′, seated adjustably on brackets H, and adapted to support the stave while in the slot *a* at different angles to the orbit of the knife D, substantially as shown, and for the purpose specified.

4. The combination of the wheel B, knife D, seated on the side of wheel B, frame A, provided with slot *a*, arms E′, attached to such frame below said slot, arm F, attached to frame A, and bar G, pivoted at one end to the arm F, outside the periphery of wheel B, and adapted to be oscillated on said arms E′ to and from the working-face of the wheel B, and to converge toward said pivotal point at the same angle with said working-face of the wheel B, substantially as shown, and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE W. PACKER.

Witnesses:
WALTER N. HASKELL,
J. F. CRISWELL.