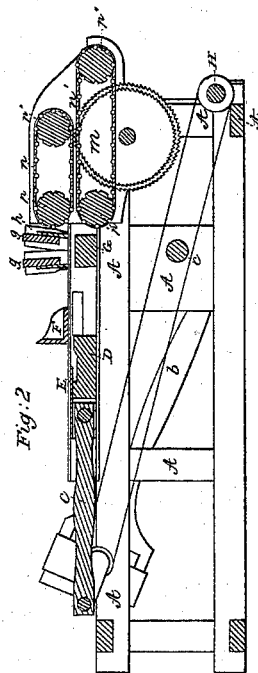


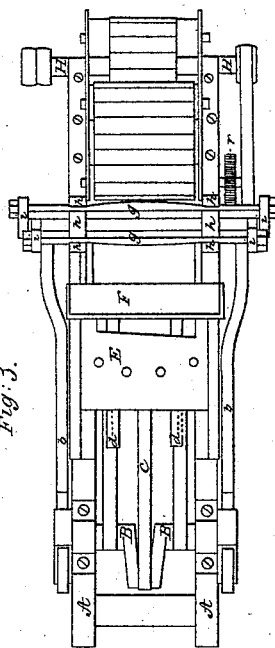
*M. Randolph,*  
*Jointing Staves.*

*N<sup>o</sup> 48,028.*

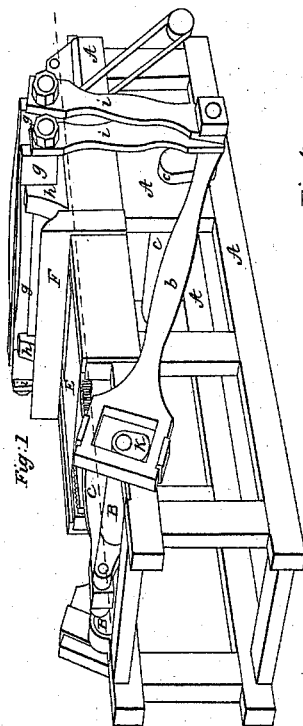
*Patented May 30, 1865.*



*Fig. 2*

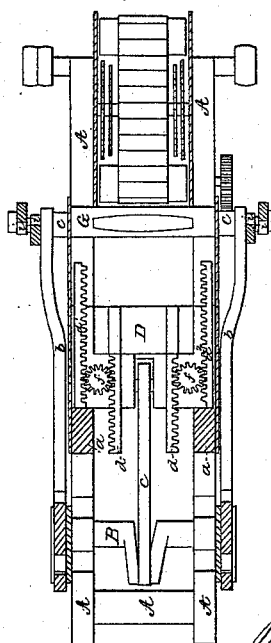


*Fig. 3*



*Fig. 1*

*Fig. 4*



*Witnesses:*

*H. C. Clifton*  
*James W. Hawk*

*Inventor:*

*M. Randolph*

# UNITED STATES PATENT OFFICE.

M. RANDOLPH, OF ST. LOUIS, MISSOURI, ASSIGNOR TO HIMSELF, J. PADDOCK, AND PRESCOTT & BURNELL.

## IMPROVEMENT IN STAVE-CUTTING MACHINES.

Specification forming part of Letters Patent No. 48,028, dated May 30, 1865; antedated May 2<sup>d</sup>, 1865.

*To all whom it may concern:*

Be it known that I, M. RANDOLPH, of the city and county of St. Louis, and State of Missouri, have invented certain new and useful Improvements in Stave-Machines; and I do hereby declare that the following is a full and clear description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon and made to form a part of this specification.

The object of this invention is to produce a machine by means of which staves may be cut from a suitable bolt and jointed and finished ready for use with a single operation of the combined machine; and the nature of the improvement relates, first, in combination with a reciprocating cutter-frame, to the use of certain devices for pushing the cut staves under the jointing-knives; second, to the arrangement and combination of two jointing-knives, so constructed, arranged, and made to operate as to joint and finish ready for use both edges of a stave at the same time; third, to the operating of said jointing knives or cutters in harmony and conjunction with the cutter-frame; fourth, to a combination of devices for cutting the crozing and finishing the ends of the staves; and, fifth, to the combination and relative arrangement of the cutter-frame with its cutter and plungers, jointing devices, and the apparatus for finishing the ends of the staves, all being constructed and arranged to operate as hereinafter set forth and represented.

In reference to the accompanying drawings, Figure 1 is a perspective view, Fig. 2 a longitudinal vertical sectional view, Fig. 3 a top view or plan, and Fig. 4 a horizontal sectional view, of my improved stave-machine.

A represents a frame of wood or metal, made in a strong and substantial manner and adapted to support the operative parts of the machine. Arranged to slide or reciprocate upon the frame A, and to be thus operated by means of crank-shaft B and pitman C, is the cutter-frame D, (seen clearly in Figs. 2 and 4,) which is made to carry the cutter E, and this knife or cutter may be made in the proper form to secure the transverse curved form or shape necessary to the staves, and with an

inclined edge to facilitate its easy working in hard wood.

F represents a stock attached to the frame A, against or in front of which the stave-bolts may be adjusted and secured for the operation of the cutter. Directly under the cutter E, and arranged to work in suitable slots or ways in the cutter-frame D, are two cogged plungers, *d d*, and near the sides of said frame D, in like manner, are arranged two cogged racks, *d' d'*.

*ff* represent two gear-wheels, secured upon frame D in such manner as to be in gear with the plungers *d* and racks *d'*, as shown distinctly in Fig. 4, by reference to which it will be readily understood that as the cutter-frame D is driven forward and the cutting of the stave from the bolt completed the forward ends of the racks *d'* will come in contact with the bar G, and, being thereby stopped, will actuate the wheels *ff* in such manner as to force the plungers *d d* forward, thereby pushing the stave already cut in a proper and exact manner by both its ends from the cutter-frame, and depositing the same upon the bar G, ready for the operation of the jointer, and as the said frame D is retracted the said racks will come in contact with the stops *a a*, and thereby, through medium of the wheels *ff*, cause the retraction of the plungers *d d* to the point necessary for them to act upon another stave.

*g g* represent the jointers, the lower edge of each of which will be formed or provided with a cutting-blade of the necessary configuration to give the required bulge or oval shape to the edges of the staves, and the said jointers will be arranged to operate vertically in ways *h h* of frame A at the necessary inclination to give the proper and required bevel to the edges of the staves. The said blades may be formed with their cutting-edges lower at their centers than at their ends, so as to cut each way from the center, and thereby improve the finish of the jointing. The said jointers *g g* will be operated conjointly in such manner as to complete the jointing of both edges of the stave at the same time by means of the eccentric-rods *b b*, through the medium of rock-shaft *c* and connecting-rods *i i i i*, and said rods *b b* will be actuated by means of cams *k k* of crank-

shaft B in such manner that the jointing process may be completed while the cutter-frame D is being retracted, and also so that the jointed stave may be released from the jointers as the cutter-frame again moves forward, and ready for removal by contact with the next stave to be jointed.

Secured upon a suitable arbor, *l*, will be arranged two cutter-heads, *m m*, so formed and adjusted as to be adapted to finish the ends of the staves and also to cut the crozing in a proper manner. The said cutter-heads for finishing the ends of the staves, and the cutters for forming the crozing may be distinct devices attached to or secured upon the same arbor or shaft; but I prefer them made together as single tools.

*n n'* represent metallic linked conveyers or feeders, operated, as usual, by means of corrugated shafts *p p' p'' p'''*, the shaft *p* being provided with a driving-pulley, that may receive motion by means of a belt from the main driving-shaft H, and with a cogged wheel, *r*, which takes into the cogged wheel *r'* of shaft *p'*. (Seen in Fig. 4.)

The operation of this improvement may be briefly described as follows: The crank-shaft B may receive motion from the main shaft H by means of one or more belts. The positions of the operative parts of the machine being as represented in the drawings, a stave-bolt, properly prepared, will be placed upon the cutter-frame, which will be made to move forward, thereby cutting a stave from the bolt, and the stave so cut will at the proper time be pushed forward by the plungers *d d* and delivered upon the bar G directly under the jointers and in the exact proper position to be operated upon by them. As the cutter-frame is retracted the jointers will perform their work, as before described, leaving the jointed stave upon the said bar G. The second stave, being cut and pushed forward, as before, will come in contact with the jointed stave and push it forward between the conveyers *n n'*,

by means of which it will be fed to the cutter-heads *m m*, and delivered, completely finished, at the end of the machine. The arbor which carries the cutter-heads *m m* may receive proper motion by means of a belt from the main shaft H.

Having thus described the construction and operation of my improvement, what I claim as new of my own invention, and desire to secure by Letters Patent, is—

1. The employment of the plungers *d d*, racks *d' d'*, and gear-wheels *f f*, or their substantial equivalents, in combination with the cutter-frame D, for the purpose of removing the cut staves and depositing them under the jointers, substantially as herein specified and represented.

2. The arrangement and combination of a double jointer, *g g*, when constructed and adjusted to operate in such manner as to complete the jointing of both edges of the stave at the same time, substantially as herein set forth and described.

3. Operating the jointer *g g* in harmony and conjunction with the cutter-frame D, so that the staves may be cut and jointed without removal from the machine, substantially in the manner herein set forth and specified.

4. The combination of the cutter-heads *m m* with the conveyers *n n'*, constructed and arranged to operate as and for the purposes set forth.

5. The combination and relative arrangement of the cutter-frame D, jointer *g g*, cutter-heads *m m*, and conveyers *n n'*, all being constructed and adjusted to operate conjointly, substantially as and for the purposes herein set forth and specified.

In testimony of which invention I have hereunto set my hand and seal this 12th day of September, 1864.

MAHLON RANDOLPH. [L. S.]

Witnesses:

H. E. CLIFTON.

FRANCIS W. RAWLE.