

*J. H. Lester,
Jointing Staves.*

N^o 4,510.

Patented May 9, 1846.

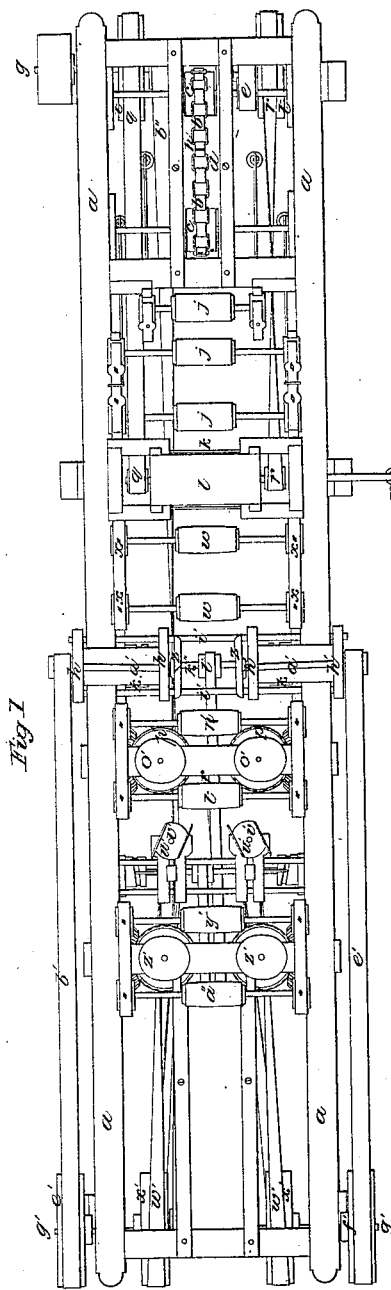
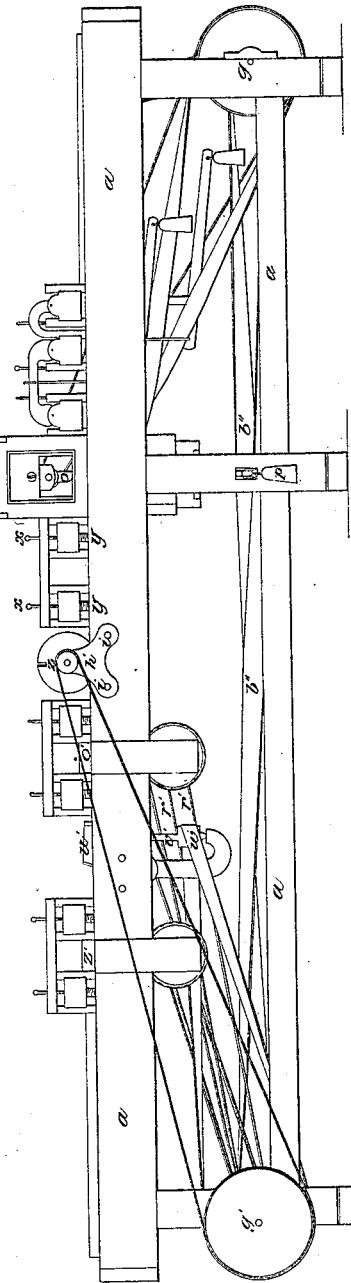


Fig 2

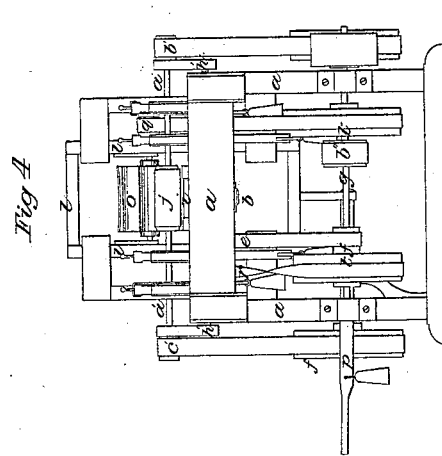
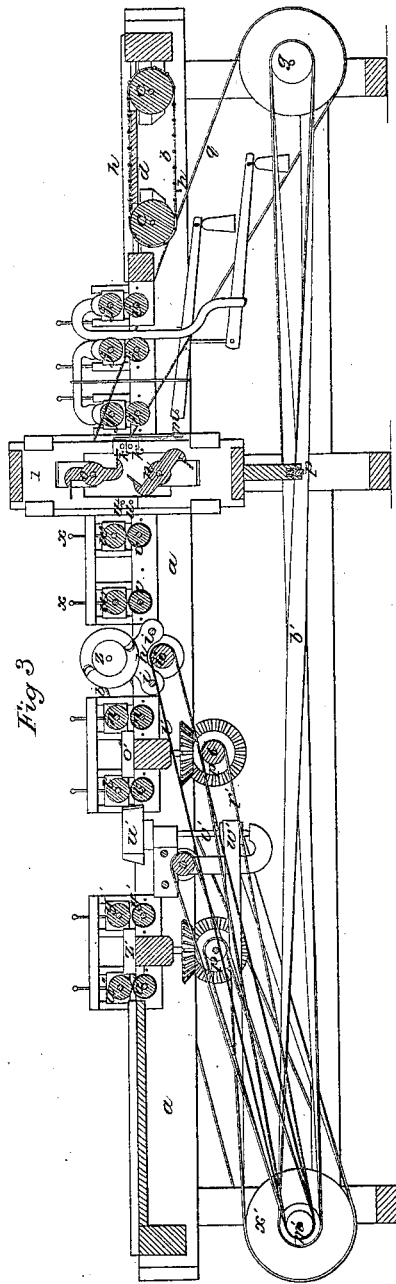


2 Sheets. Sheet 2.

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UNITED STATES PATENT OFFICE.

JOHN H. LESTER, OF NEW LONDON, CONNECTICUT.

MACHINERY FOR DRESSING STAVES.

Specification of Letters Patent No. 4,510, dated May 9, 1946.

To all whom it may concern:

Be it known that I, JOHN H. LESTER, of New London, in the county of New London and State of Connecticut, have invented
5 new and useful Improvements in Machines for Dressing and Jointing Staves for Barrels, Casks, and other Coopers' Ware, and that the following is a full, clear, and exact description of the principle or character
10 thereof which distinguishes them from all other things before known, and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan; Fig. 2, a longitudinal elevation; Fig. 3, a longitudinal vertical section; and Fig. 4, an end elevation.

The same letters indicate like parts in all
20 the figures.

The dressing and jointing of rived staves by machinery are operations which have heretofore presented much difficulty and of the various attempts to attain these important
25 ends by means of rotating planes, none have, so far as I am informed, been successful. The difficulty arises from the fact of the uneven and crooked condition of the rived bolts which must be dressed with the
30 grain of the wood and of equal thickness; and the necessity of jointing the curved edges of the staves to give the bulge to the barrel or cask by a continuous movement. The dressing of staves has been essayed by
35 two rotating planes, one to plane or dress the concave, and the other the convex surface—the planes being placed one forward of the other, so that the staves pass from the one to the other; but in this there is no
40 method by which the planes can adapt themselves to the bends and crooks of the bolts. Attempts have also been made to joint the edges with rotating planes by placing the
45 stave, after being dressed, on a reciprocating carriage provided with guides to cause the rotating planes to approach toward and recede from each other to give the required bulge to the staves.

The improvements which I have made,
50 and which I wish to secure by Letters Patent, remove these difficulties, and consist, first, in hanging the two rotating planes, one above the other, in a vertically sliding frame to receive the bolt from the feeding
55 or guide and pressure rollers and pass them to other rollers which deliver, or conduct

them to the jointing operation, the frame sliding up and down to adapt the planes to the bends or crooks of the bolts, the sliding
60 of this frame being effected by two sets of rollers, hung in the frame, one forward and the other back of the rotating planes. And second, in giving to the frames in which the jointing cutter heads are hung and run reciprocating movements toward and from
65 each other by means of cam grooves, eccentrics, cranks, or other analogous device as the staves are fed forward by a positive motion, the continuous feeding, and the reciprocating motion of the cutter heads be-
70 ing made to correspond.

In the accompanying drawings (a) represents a frame properly adapted to the various parts of the machine, and (b) an end-
75 less chain or belt passing around two drums or rollers (c, c) and over a bed or platform (d), and driven by a belt (e) from a wheel (f) on the shaft (g). This chain is provided with two projections or flanches (h)
80 placed at distances apart equal to the length of a stave, for the purpose of feeding in the staves and forcing them through one after another, between three sets of bed rollers (i, i, i) and upper pressure rollers (j, j, j),
85 to the rotating planes, the three sets of rollers being necessary to the proper presentation of the bolt, in consequence of the frequent bends and crooks in the bolts, for if there were but two sets on the presentation
90 of a crooked bolt the end would be carried into one or the other of the rotating planes, and it is farther necessary that the last upper roller, or that nearest the planes, should be farther from the middle one than the
95 first, or pressed down with a greater weight to insure the proper presentation of the bolt when the two ends are bent up, for the end which is presented to the planes must be in the proper line. The bed rollers (i, i, i)
100 run in permanent bearings and the upper ones (j, j, j) are weighted in the usual manner of pressure rollers. As the bolt leaves the last of these rollers, it passes between two small rollers (k, k) hung in the sliding
105 frame (l) of the rotating planes, the under one in permanent, and the upper one in sliding boxes and pressed down by means of spiral or other springs (m), or weighted levers, and these rollers must be placed as
110 near the rotating planes as possible, as their purpose is to present the end of the bolt to the two rotating planes (n, o), and to guide

the sliding frame up and down to cause the planes to follow the crooks and bends of the bolts. These rotating planes are constructed in manner similar to the well known planing machines, except that the edges of the planes instead of being straight and parallel with the shaft, are curved those of the under one (n) to dress the concave, and those of the upper one to dress the convex surface of the stave; they are driven by belts (q, r) from wheels (t) on the shaft (g). The sliding frame (l) in which these planes are hung slides vertically in the main frame of the machine and is balanced with a lever and counter weight (p) to facilitate its movement up and down. On the other side of the planes there are two other small rollers (u, u) for a like purpose, and similar to the two above described, except that the upper one of this set instead of being a weighted pressure roller runs in permanent boxes, when the machine is intended for one thickness of staves, but when it is intended for various thicknesses, then it, as well as the upper rotating plane must be provided with sliding boxes and set screws.

When the dressed stave is delivered from the planes it passes between two sets of carrying rollers (v, v) and (w, w), made concave and convex to fit the dressed surfaces of the staves, the lower ones (v, v) running in permanent boxes, and the upper ones in sliding boxes provided with set screws (x), and resting on spiral or other springs (y), by which they are borne up to the screws. These rollers present the staves to the action of two rotating heads (z, z), provided with cutters on their faces, and near to their peripheries for the purpose of roughly shaping the edges of the staves preparatory to jointing. These rotating cutter heads are on the ends of horizontal shafts (a', a'), inclined as represented in the drawings, and driven by belts (b', c') from wheels (e', f') on the shaft (g'). As the staves are wider in the middle than at the ends, it is necessary that the cutter wheels move toward and from each other as the stave passes between them, and this is effected by having the shafts of the cutter wheels hung in frames (h', h') that slide on rods (i', i'), (or on ways) with a stud from the underside that runs in a cam groove (k') (in manner well known) cut in a roller on a shaft (k'') that makes one revolution during the passage of each stave, motion being communicated by a belt (l') from a pulley (m') on the shaft (g'), so that the cutter wheels are nearest together as the end of the stave is presented; they are then gradually separated as the stave progresses toward the middle, and then gradually approach as the stave passes from the middle to the end. Instead of these cam grooves, eccentrics, cranks, or other analogous de-

vices may be substituted. From these cutter wheels the staves pass between two rollers (n', n'), similar to the rollers (v, w), and then between two vertical elliptical rollers (o', o'), which, by their form are adapted to the form of the edges of the staves, and guide them to the succeeding operation. These two rollers are geared together by bevel wheels (p', p') on their arbors and on a horizontal shaft (q') which receives motion by a belt (r'), from a pulley (s') on the shaft (g'). From these elliptical rollers the staves pass between two other horizontal rollers (t', t') and are presented to the action of two cutter wheels (u', u'), on vertical shafts (v', v'), driven by belts (w', w'), from wheels (x', x') on the shaft (g'). These cutter wheels (or cutter heads) give the last dressing to the joints of the staves, and the frames in which they are hung move toward and from each other in manner similar to the rotating heads (z, z), before described, and by the same mechanical means, and the bevel is given to the edges of the staves by either inclining the shafts of the cutter heads, or beveling the cutting edges of the cutters. From these cutters the staves pass between two horizontal rollers (y', y'), then between two other guide elliptical rollers (z', z'), made and operated in manner similar to the rollers (o', o') before described, and are then delivered by another set of horizontal rollers (a'', a'').

The machine is driven by a belt from some first moved communicating motion to the shaft (g), and from this to the shaft (g') by a cross belt (b''). The cutter heads and the elliptical guide rollers can be provided with set screws and slides for the purpose of adapting them to various widths of staves, in manner well known to persons skilled in the art of constructing machinery. To insure the accurate working of the various parts of the machine instead of communicating motion to the feeding chain or belt, the cam grooves for giving the reciprocating motion to the jointing cutter heads and to the guide elliptical rollers, by belts, this may be done by cog-gearing or cogg chains.

It will be obvious that instead of dressing and jointing the staves in one machine, and continuously, these two operations may be separated into two machines by providing the jointing part with a feeding chain or belt in manner similar to that described above; and when this is done, I contemplate carrying the feeding chain entirely through the jointing machine with projecting flanges as above described at such distances apart as to separate the staves sufficiently to finish their ends. The elliptical rollers for guiding the staves in the operation of jointing may be eccentric instead of elliptical by giving them double the number of revo-

lutions, the object being to adapt their form to the bulge of the staves. And I wish it to be distinctly understood that the staves may be jointed by means of one set of cutter heads alone instead of two as described, 5 but in a less perfect maner.

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

10 1. Hanging the two rotating planes in a vertical frame which slides freely up and down to adapt the planes, to the crooks and bends of the wood, as herein described.

2. I claim the employment of the two sets of rollers, or either of them, running in the 15 vertically sliding frame in combination with the rotating planes, for the purpose of guiding the rotating planes and adapting them to the dressing of crooked or bent staves, as herein described.

20 3. I claim in combination with the rotating planes, the arrangement of the three sets of rollers that guide and conduct the bolt

to the rollers and rotating planes in the sliding frame the set nearest the sliding frame having the preponderance of the one 25 that first receives the bolt, as described, for the purpose of properly presenting crooked or bent bolts to the action of the planes, as described.

4. I claim giving to the cutter heads for 30 jointing the staves a reciprocating movement toward and from each other in combination with the continuous feeding in and movement of the staves through the machine, as described. 35

5. And finally, I claim the employment of the elliptical or eccentric guide rollers in combination with the cutter heads, as herein described.

JOHN H. LESTER.

Witnesses:

C. W. M. KELLER,
A. P. BROWNE.