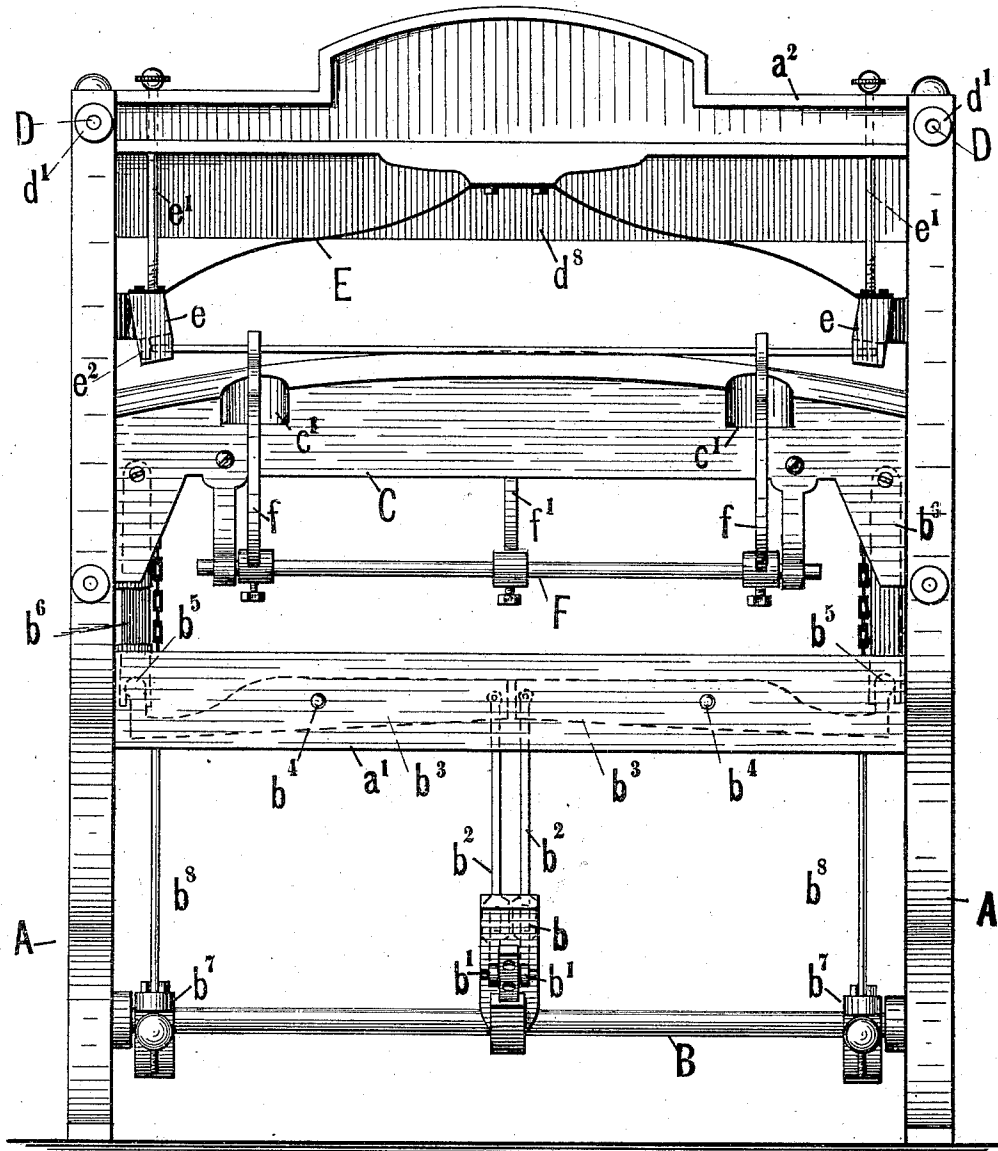


E. D. & I. BUCKMAN.
MACHINE FOR JOINTING STAVES.

No. 314,648.

Patented Mar. 31, 1885.

Fig. 1.



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Fig. 2.

Fig. 3.

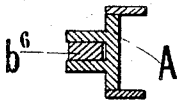


Fig. 4.

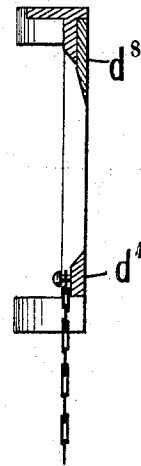
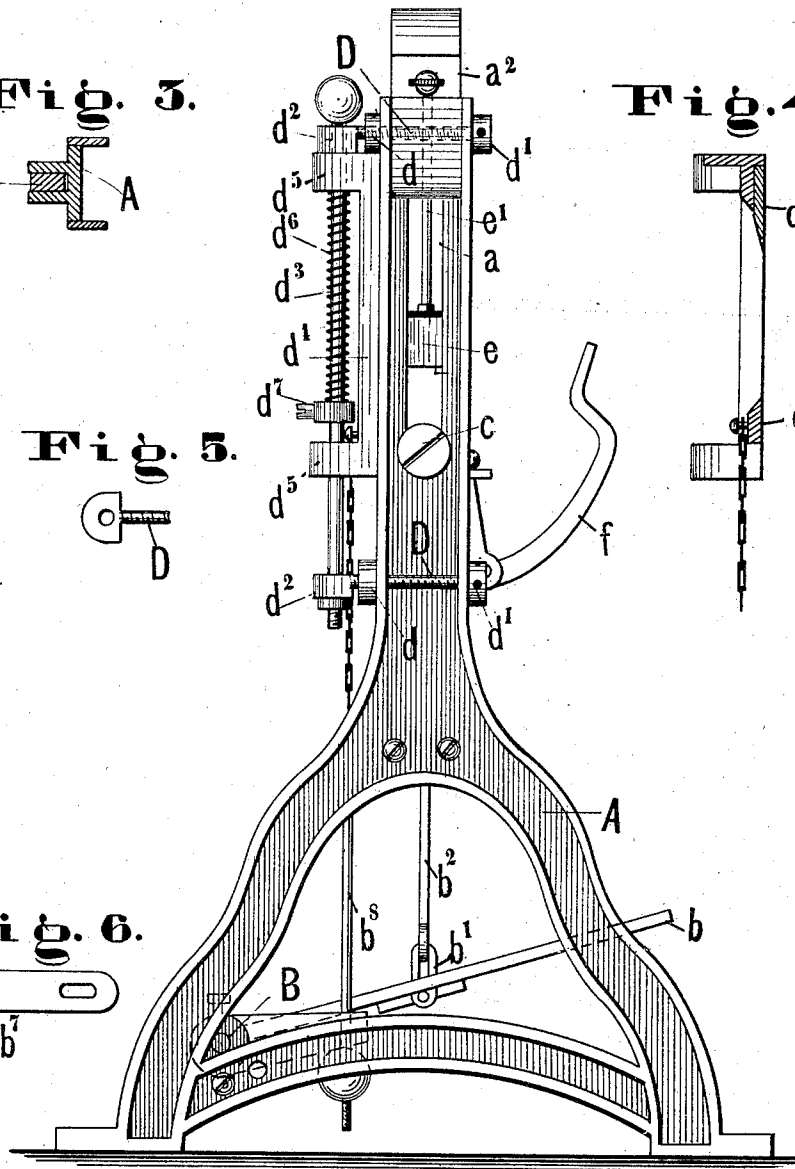
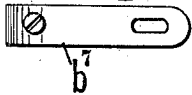


Fig. 5.



Fig. 6.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR JOINTING STAVES.

SPECIFICATION forming part of Letters Patent No. 314,648, dated March 31, 1885.

Application filed June 6, 1884. (No model.)

To all whom it may concern:

Be it known that we, ERWIN D. BUCKMAN and IRA BUCKMAN, of Brooklyn, county of Kings, and State of New York, have invented
5 new and useful Improvements in Machines for Jointing Staves; and we do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of
10 reference marked thereon.

This invention relates to that class of machines for jointing staves in which the stave, before being cut to form the joint, is bent into a curved position, like that occupied by it
15 when in place in the barrel; and it consists mainly, first, in the combination of the following elements: a supporting-bed having a curved bearing-face, a knife having a cutting-edge which is straight in the direction of its
20 length, a holding-clamp, and an actuating-lever, the construction being such that by a single impulse of the lever the stave is clamped upon the supporting-bed and cut by the knife to form the proper joint; second, in the combination of the following elements: a vertically-moving supporting-bed and a relatively-fixed clamping device, the construction being
25 such that by the movement of the bed the stave is carried against the clamping device and strongly held in proper position to be acted upon by the cutter; and, third, in the combination of the following elements: a supporting-bed having a curved bearing-face adapted to hold the stave in that position
30 which it occupies in the barrel, and a clamping device adapted to bear equally and simultaneously upon each end of the stave, and strain the same into position upon the supporting-bed.

40 It consists, further, in certain other subordinate features and in certain details of construction, which, in connection with the foregoing, will be fully described hereinafter.

In the drawings, Figure 1 represents a front view of our improved machine; Fig. 2, an end view of the same; Fig. 3, a transverse sectional view of one of the standards, A, and one of the connecting-bars, b^2 ; Fig. 4, a vertical sectional view of the knife-frame; Fig. 5, a partial side view of one of the adjusting-screws, D, detached, and Fig. 6 a plan view of one of the levers, b^1 , detached.

To enable others skilled in the art to make and use our improved machine, we will pro-

ceed to describe fully the construction and operation of the same.

For convenience and clearness, the description of the machine will be given under several heads, as follows: first, the frame-work; second, the actuating mechanism; third, the
60 supporting-bed; fourth, the knife; fifth, the clamping device; sixth, the equalizing-guides.

First, the frame-work:

A A, Figs. 1 and 2, represent vertical standards of any proper construction, forming
65 the end pieces of the machine, which standards are provided below with a base portion extending in a horizontal direction to afford the proper stability, and above with a contracted portion extended in a vertical direction
70 to afford proper support to some of the parts, as shown in Fig. 2.

a , Fig. 2, represents a slot or opening in the upper portion, the purpose of which will be hereinafter explained.

a' , Fig. 1, represents a transverse bar or girder, which, in connection with a similar girder on the rear side of the machine, extends across the machine below the center of the same, and unites together the vertical
80 standards A A by any proper means of connection.

a^2 , Fig. 1, represents a transverse bar or girder, extending across the machine at the top of the same, and secured at its ends within
85 the slots a of the vertical standards A A in any proper manner.

The bars a' a^2 form, in connection with the vertical standards A A, a compact frame-work which possesses great strength and rigidity.

Second, the actuating mechanism:

B, Fig. 1, represents a transverse shaft held in proper bearings in the standards A A, near the feet of the same, at the rear side of the
95 machine, as shown.

b represents a treadle or foot-lever, secured at its rear end to the center of the shaft B in any proper manner; b^1 b^1 , links attached to the treadle at any proper point, and b^2 b^2 connecting-rods by means of which the links and treadle are united to the inner ends of the levers b^3 b^3 , as shown in dotted lines, Fig. 1.

b^4 b^4 represent the pivot-shafts of the levers, which shafts are secured in the transverse bars
105 a' a' , as shown.

b^5 b^5 represent cylindrical bearing portions formed on the outer ends of the levers b^3 b^3 ,

which portions are adapted to engage with the corresponding recesses in the lower ends of the connecting-bars $b^5 b^6$, resting upon the levers, as shown. The upper ends of the bars $b^5 b^6$, it will be observed, are pivoted to the supporting-bed, hereinafter referred to, their body portions being held in vertical recesses of the standards A A, as shown.

The operation of this portion of the actuating mechanism is substantially as follows: Whenever the treadle is depressed by the foot of the operator, the inner ends of the levers $b^3 b^4$, by means of the links $b^1 b^2$ and connecting-rods $b^2 b^2$, are drawn downward, and their outer ends consequently forced upward. This upward movement of the outer ends of the levers $b^3 b^4$ causes the connecting-rods $b^5 b^6$, resting thereon, to rise and lift the supporting-bed, which is attached thereto.

$b^7 b^7$ represent arms projecting forward from the shaft B near each end, which arms are provided near their ends with the vertical slots, as shown.

$b^8 b^8$ represent connecting-rods extending through the slots in the arms $b^7 b^7$, which rods have a threaded portion with ball-nut thereon at the lower ends, and a chain-connection at their upper ends secured above to the lower bar of the knife-frame, hereinafter referred to.

The operation of this part of the actuating mechanism is substantially as follows: Whenever the treadle is depressed by the foot of the operator the ends of the arms $b^7 b^7$ are depressed, and consequently the frame of the cutting-knife, attached to the arms $b^7 b^7$ by the rods $b^8 b^8$, is also depressed.

Third, the supporting-bed:

C represents the supporting-bed, consisting of a heavy block of proper form, which is essentially provided with an upper bearing-face curved in the direction of its length and width to correspond with the curved line which the stave occupies when in its proper position in the barrel.

c , Fig. 2, represents a screw extending through the slots $a a$ of the standards A A into the ends of the block, by means of which the latter is properly secured in place and guided in its movement.

$c' c'$ represent recesses formed in the front side of block at its upper edge, which recesses are adapted to afford the proper space for the hands of the operator when using the equalizing-guides to adjust a narrow stave.

This supporting bed-block, it will be understood, is itself supported by the bars $b^5 b^6$, before referred to.

When the treadle is depressed, as before described, the supporting-bar is given an upward movement.

Fourth, the knife:

D D represent adjusting-screws extending through the standards A A from front to rear, on each end of the machine, one of the screws being located at the top of the standard and the other near the center, as shown in Fig. 2.

d represents a collar located between the

head of the screw and the standard, and d' a securing-nut.

$d^2 d^2$ represent ears forming the heads of the screws, which ears are provided with vertical openings, as shown.

d^3 represents a guide-rod held at each end by an ear, d^2 , which guide-rod is provided above with a head and below with a nut, as shown.

d^4 represents a frame having ears $d^5 d^5$ at its ends, which ears inclose the guide-rod d^3 and slide thereupon, as shown.

d^6 represents a spring surrounding the guide-rod d^3 , below the upper ear, d^2 , and d^7 a set-collar supporting the lower end of the spring.

d^8 represents the knife, which is secured to the upper bar of the frame in any proper manner. The cutting-edge of this knife in the direction of its length is essentially straight, but in the direction of its width it may be curved or inclined, if desired.

When the treadle is depressed, as before described, the knife-frame is given a downward movement.

By means of the adjusting-screws D D, having the collars d d , it is possible to adjust the knife properly in its relation laterally to the supporting-bed.

By means of the set-collar d^7 , the tension of the spring d^6 may be regulated at will.

Fifth, the clamping-device:

E represents a plate-spring of proper form, which is fastened at its center to the lower face of the transverse bar a^2 .

$e e$ represent blocks secured to the ends of the arms of the spring, which are provided below with bearing-faces, curved to coincide with the end portions of the stave, against which they bear.

$e' e'$ represent adjusting-rods extending upward through a slot in the bar a^2 , the upper end of each of which has a head, and the lower end of each of which has a threaded portion extending into the block, as shown.

e^2 represents a pin depending from one of the blocks, which is adapted by its position to indicate the proper location for one end of the stave which is to be cut.

Whenever the supporting-bed is raised by the action of the treadle, as before described, the ends of the stave laid thereon are forced upward simultaneously against the blocks of the clamping-spring, and by the joint action of the bed and spring-blocks are strongly held during the cutting action.

By means of the adjusting-rods $e' e'$ the blocks may be readily adjusted in the proper position to permit the convenient insertion of the stave into the space between them and the bed.

Sixth, the equalizing-guides:

F represents a shaft supported by proper bearing-arms depending from the bed-block, which shaft is provided near each end with the long arms $f f$, with bent ends, as shown, and at its center with the short arm f' , as shown.

The shaft F is so located that the bent ends of the arms *f f* are adapted, when properly moved, to press backward simultaneously and equally the ends of the stave. The short arm *f'*, by contact with the bed-block, limits the forward movement of the arms *f f* to the proper point.

The operation of this mechanism is substantially as follows: After the stave has been cut upon one side to form the joint, it is removed and turned end for end, laid upon the bed again, and moved backward by the guides *f f* until the proper point has been reached. It is then cut as before. By this means the stave is made equal in width at the same points on each side of the transverse center line.

The operation is substantially as follows: A stave of rectangular form, as received from the cutting-machine, is laid upon the upper face of the supporting-bed, and adjusted in the proper position longitudinally by moving one end against the stop-pin *e'*, and in the proper position laterally according to the judgment of the operator, the edge of the stave being caused to overhang slightly the cutting-edge of the bed in the manner well understood. The foot-lever is then depressed, and by its action the supporting-bed, in the manner before described, is caused to rise with the stave and press the ends of the same against the blocks of the clamping-spring.

The movement of the supporting-bed commences before the movement of the knife, and hence it is impossible for the cutting action to occur before the stave is fully clamped.

Soon after the bed begins its upward movement the knife begins its downward movement, and the two act together to cut the joint of the stave in the manner well understood.

The clamping-spring, which is slightly under tension when the bed begins its upward movement, exerts a constantly-increasing resistance until the cutting action is fully performed. By this means the stave is strongly clamped at its ends until the end portions are cut, these latter portions, owing to the curved position of the stave, being acted on last. By means of the bent position of the stave and the form of the cutting-knife the cutting action is caused to begin at the center of the stave and extend toward each end with the grain of the wood.

When the stave is cut upon one side to form the joint, it is taken out of the machine, turned end for end, laid upon the bed, and moved to its proper lateral position by the equalizing-guides in the manner well understood.

The various parts of the machine are properly balanced, so that only the necessary power to perform the cutting action is required.

Some of the advantages of the described construction are as follows: All the necessary actions to cut the stave properly after it has been adjusted in position are performed by a single impulse of the actuating-lever. The action of the clamping device is entirely

automatic, it requiring no attention whatever from the operator. The general construction is very simple, and yet the action is very effective. The supporting-bed may be removed for the insertion of another block of a different size by simply taking out the screws *c c*.

If desired, the supporting-bed may be rigidly fixed, and the clamping device and knife be made capable of the proper movements. If desired, also, the clamping device and knife may be rigidly fixed, and the bed be made capable of the proper movement.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination of the following elements: a vertically-moving supporting-bed having a curved bearing-face, a relatively-fixed clamping device, a relatively-fixed cutter having an edge which is straight in the direction of its length, and means, substantially as described, for moving the bed and stave lying thereon against the clamping device and cutter.

2. The combination, with the vertically-moving supporting bed C, having a curved bearing-face, and the relatively-fixed clamping device E, of the vertically-moving knife *d'*, having an edge which is straight in the direction of its length.

3. In combination with the vertically-moving supporting-bed C, the vertically-fixed clamping-spring E, having the blocks *e e*, adapted to bear upon the stave, and means substantially as described, for moving the stave against the bearing-blocks, for the purpose set forth.

4. In combination with the vertically-moving supporting-bed C, the relatively-fixed clamping-spring E, having the bearing-blocks *e e*, and adjusting-rods *e' e'* for holding the stave, and means, substantially as described, for moving the staves against the bearing-blocks of the spring.

5. In combination with a vertically-moving supporting-bed having no lateral movement, the frame *d'*, having the cutting-knife rigidly attached thereto, as far as lateral movement is concerned, and the adjusting-screws D D, having the collars *d d*, nuts *d' d'*, and guide-rods *d'' d''*, as described.

6. In a stave-jointing machine having a straight-edged knife and a vertically-moving supporting-bed adapted to move the stave into contact with the knife, the grooved standards A A, the bars *b'' b''*, and lever mechanism, substantially as described, the bars *b'' b''* connecting the lever mechanism to the supporting-bed, substantially as described.

This specification signed and witnessed this 3d day of June, 1884.

ERWIN D. BUCKMAN.
IRA BUCKMAN.

Witnesses:

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