2 Sheets--Sheet 1.

E. & B. HOLMES.

Machine for Jointing Staves.

Patented Aug. 17, 1875.

No. 166,872.

Fig. 1.

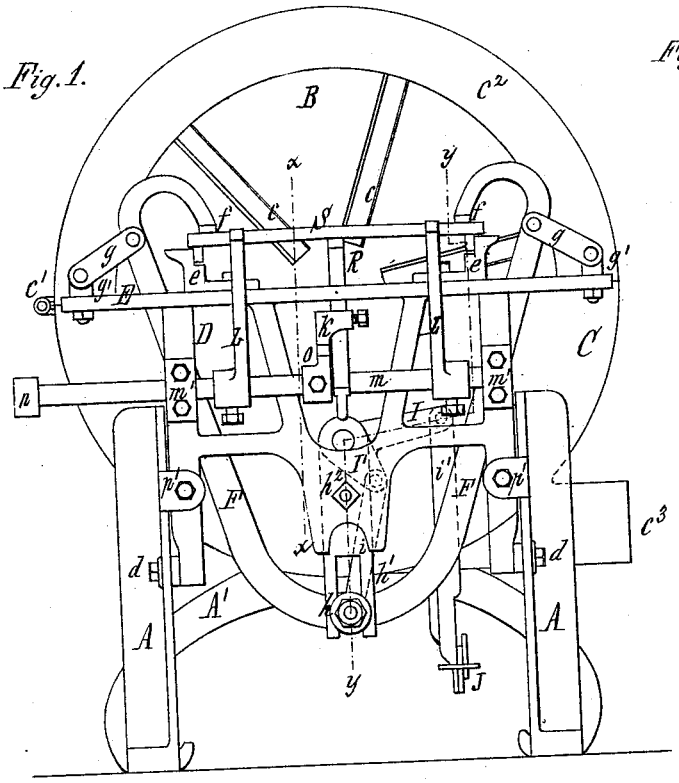


Fig. 2.

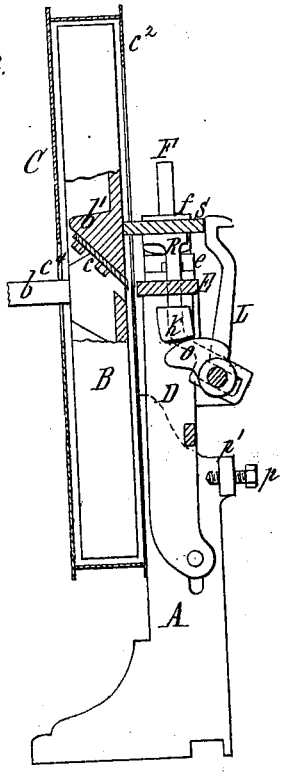


Fig. 3.

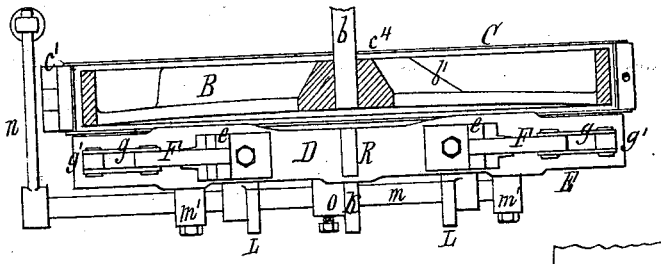
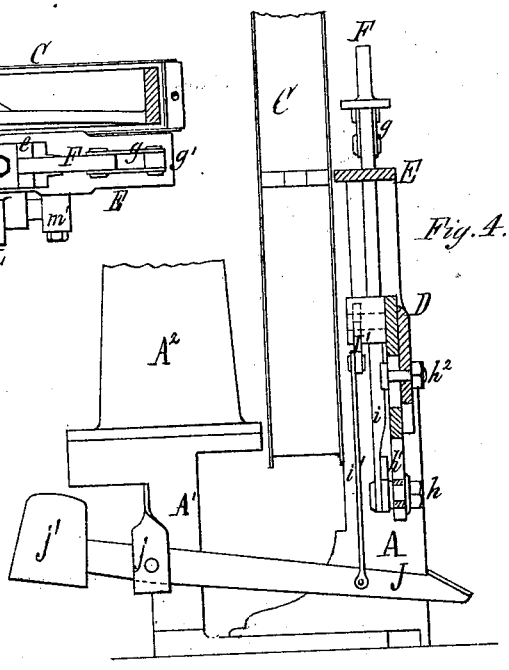


Fig. 4.



Witnesses.

Ernest Hoddick

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Britain Holmes Inventors
by Jay Hyatt Atty.

2 Sheets--Sheet 2.

E. & B. HOLMES.

Machine for Jointing Staves.

No. 166,872. Patented Aug. 17, 1875.

Fig. 5.

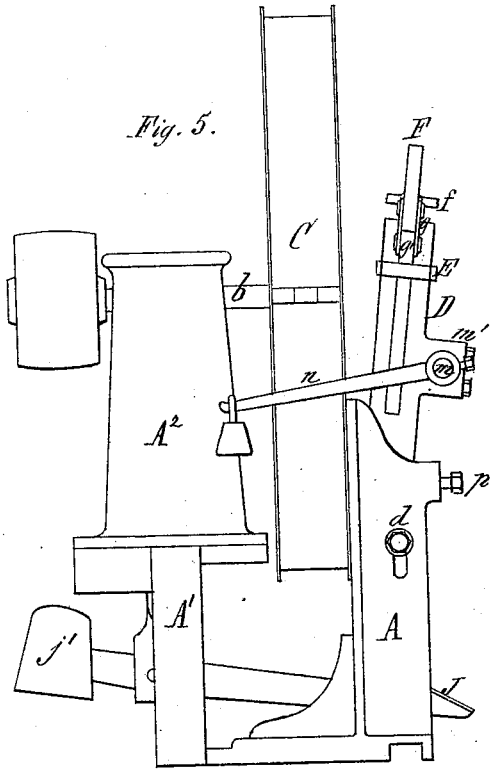


Fig. 8.

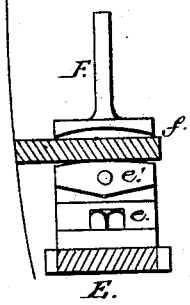


Fig. 9.

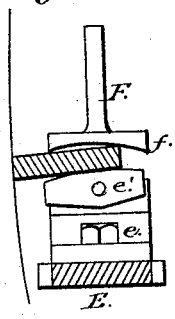


Fig. 6.

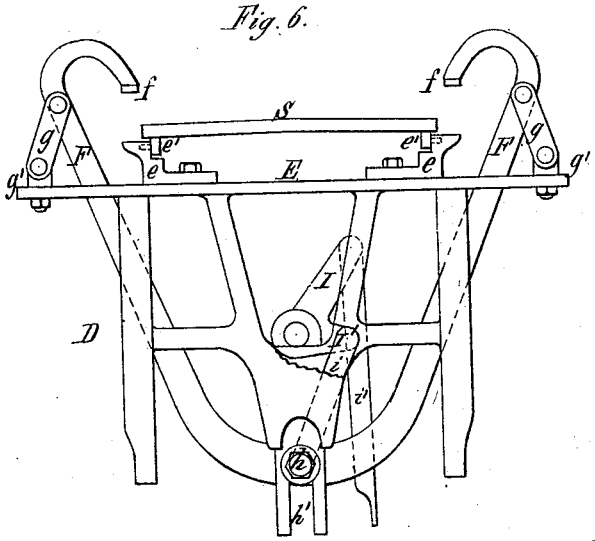
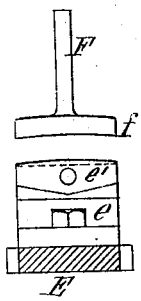


Fig. 7.



Witnesses.
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Ernest Hoodeck

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Edward Holmes
Britain Holmes
By Jay Hyatt
Atty.

UNITED STATES PATENT OFFICE.

EDWARD HOLMES AND BRITAIN HOLMES, OF BUFFALO, NEW YORK.

IMPROVEMENT IN MACHINES FOR JOINTING STAVES.

Specification forming part of Letters Patent No. **166,872**, dated August 17, 1875; application filed August 7, 1874.

To all whom it may concern:

Be it known that we, EDWARD HOLMES and BRITAIN HOLMES, both of the city of Buffalo, in the county of Erie and State of New York, have invented certain Improvements in Machines for Jointing Staves, of which the following is a specification:

Our improvements relate to that class of machines which contain a vertical cutter-wheel, against the face of which the stave to be jointed is held by a swinging frame.

The invention consists, principally, in the combination with the cutter-wheel, of peculiar construction, to be hereinafter more fully set forth, of a fan-case, whereby the cutter-wheel is enabled to operate as a fan and produce an air-current, by which the shavings are carried off. It further consists of various mechanical appliances for properly supporting, clamping, and presenting the stave to the action of the cutter-wheel.

In the accompanying drawings, consisting of two sheets, Figure 1 represents a front elevation of a machine provided with our improvements. Fig. 2 is a vertical section in line *x x*, Fig. 1. Fig. 3 is a top-plan view, with the cutter-wheel in section. Fig. 4 is a section in line *y y*, Fig. 1. Fig. 5 is a side elevation of the machine. Fig. 6 is a detached view of the stave-clamping mechanism. Fig. 7 is a cross-section on an enlarged scale in line *z z*, Fig. 6. Fig. 8 is a similar view of the same with a stave clamped and in the position it is while being jointed. Fig. 9 is a similar view, showing the position of the pivoted rest when clamping a stave of lesser width.

Like letters of reference designate like parts in each of the figures.

A A are the stationary side frames of the machine, connected at the rear by a bridge-piece, A^1, carrying a standard, A^2. *b* is the driving-shaft supported in the latter, and B a cutter-wheel mounted on one end thereof, and is made concave on its face, so as to impart to the edge of the stave the required curved form for producing the bilge to the barrel. *c* are the knives or cutters, arranged in recesses of the wheel B in a common manner. C is the fan-case, partially inclosing the cutter-wheel B. Its lower half is secured to the side frames A, so as to be stationary, while its upper half is hinged to the lower half, as shown at c^1, so as to be readily swung open to permit access to the rear side of the cutter-wheel. The front portion of the upper half of the fan-case C consists of a narrow rim, c^2, of such width as to inclose the rim of the cutter-wheel, while exposing the upper half of the front or face thereof, against which the stave is held in being jointed, as clearly shown in Figs. 1 and 2. The inclined projections b', formed on the rear side of the cutter-wheel for the reception of the cutters, act as fan-blades in connection with the case C, and create a current of air, by which the shavings are expelled through the discharge-spout c^3 of the fan-case and carried way. The air is admitted to the fan-case through an opening, c^4, formed at the rear side of the fan-case around the shaft *b*. D is the swinging frame, by which the stave to be jointed is moved against and from the cutter-wheel. It is arranged between the side frames A, and swings or oscillates on bolts *d d* as pivots, passing through its lower end and through vertical slots in the side frames, as shown in Fig. 2, whereby the frame D is made vertically adjustable, for a purpose presently to be explained. E is the upper horizontal cross-bar of the frame D, arranged near the center of the cutter-wheel; and *e e*, two bearing-pieces secured to the upper side thereof, to which are pivoted blocks or rests *e'*, for supporting the ends of the stave, as shown in Fig. 7. F F are the stave-clamping arms, the lower ends of which are jointed together by a pin, *h*, sliding in a vertically-slotted extension, h^1, of the frame D. This extension h^1 is attached to the frame D by a bolt, h^2, so as to be vertically adjusted. The curved upper ends of these clamping-arms are provided with jaws *f f*, made with concave faces, as shown in Fig. 7. *g g* are links connecting the upper ends of the clamping-arms F with a fulcrum-post, *g'*, secured to the cross-bar E near its ends. The post *g'* and bearing-pieces *e* are preferably made adjustable on the bar E, to adapt them to staves of different lengths. I is the long arm, and I' the short arm, of a bell-crank lever, pivoted in the frame D at some distance above the pin *h*. The short arm I' of said lever is connected with the pin *h* by a link, *i*, and the long arm I by a link, *i'*, with a treadle, J, having its fulcrum at *j* in the rear portion of the frame of the machine, and carrying at the opposite end a weight, *j'*, tending to retain the treadle J and clamping-arms F in a raised position. By depressing the treadle J the jaws *f* of the

arms F are brought down upon the stave S, as shown in Fig. 1, the relative lengths of the arms of the lever I I′ enabling a sufficient pressure to be applied to the stave to hold it firmly on the rests *e′* while being jointed. In releasing the arms F the links *g* cause their upper ends carrying the jaws *f* to swing outwardly while swinging upwardly, so as to recede from the rests *e′ e′*, whereby the stave S is enabled to be freely raised from the latter, and a new one placed therein, as clearly shown in Fig. 6.

The cross-bar E and the side pieces of the frame D are slotted to permit the passage of the arms F. *m* is a horizontal shaft, supported in bearings, *m′* attached to the swinging frame D. L L are two arms mounted on the shaft *m*, and held with their upper ends against the outer edge of the stave by a weighted arm, *n*, secured to the shaft *m*. R is a central stave-support, passing through the cross-piece E, so as to slide therein; and O, a cam mounted on the shaft *m*, and engaging under a projection, *k*, on the central support R, for raising the latter.

The clamping-arms F being in an open distended position, as shown in Fig. 6, a stave is placed upon the rests *e′*, with its inner edge projecting a proper distance beyond the ends of the rests *e′*. The guide-arms L, being kept in contact with the outer edge of the stave by the weight-arm *n*, facilitate the arrangement of the stave parallel with the face of the cutter-wheel. To insure the proper jointing of staves of different widths, it becomes necessary that the wider staves be bent to a greater degree than those of less width. This we accomplish by means of the guide-arms L L and adjustable central rest R. These guide-arms are so arranged on the shaft *m* that when a stave of ordinary width is placed on the rests *e′ e′*, with the guide-arms bearing against its outer edge, the cam O will be in a position to support the central rest R at its proper height relative to the end rests *e′ e′*. The parts being thus adjusted, and a stave arranged in place on the rests, it is clamped and held in place by pressing upon the treadle J, which draws downward and inward the clamping-jaws upon the stave to the position shown in Fig. 1, clamping the stave upon its three rests, with the proper curvature imparted thereto. The central rest, when adjusted by means of the stave and arms L, as above described, is supported by the cam O, which is prevented from turning by the arms L resting against the outer edge of the stave. When a stave of greater width is arranged on the frame D, the arms L, which bear against the outer edge of the stave, are made to assume a different position from what they previously did, thereby changing the position of the cam O, which now supports the central rest R in a higher position, so as to impart to the stave the required greater curvature. In clamping a stave of greatest width, the two extreme points or ends of the curved jaws *f* rest upon the upper side of the stave and hold it at the inclination shown in Fig. 8. With a stave of less width the outer edge of the stave will bear against some portion of the concave inside of the end of the jaw, thereby giving the stave a different inclination, as shown in Fig. 9, the pivoted rest adapting itself to the under side of the stave at whatever angle it may be clamped. The pressure on the treadle J, in clamping the stave, also swings the frame D toward the cutter-wheel, so as to bring the edge of the stave in contact therewith, whereby it is jointed in a common manner. As the curvature of the concave cutter-wheel decreases from its center to the circumference, it is obvious that the degree of curvature given to the edge of the stave by this cutter-wheel will vary, as the stave is held against the wheel at a point nearer to or farther from the outer edge of the wheel. By making the frame D vertically adjustable, the machine can be readily adapted to joint staves with a greater or less curvature, as may be required. The outward movement of the frame D is limited by set-screws *p*, passing through lugs *p′* of the side frames of the machine.

What we claim as our invention is—

1. The combination, with the cutter-wheel B of a stave-jointing machine, provided with the projections *b′*, of a case partially inclosing the cutter-wheel, and forming in connection therewith a fan, by which the shavings are collected and carried off, substantially as hereinbefore set forth.

2. The combination, with the hinged frame D, stave-rests, and clamping-arms F F, of the links *g g*, substantially as and for the purpose hereinbefore set forth.

3. The combination, with the frame D and clamping-arms F F, of the link *i*, bell-crank lever I I′, and treadle and link J *i′*, substantially as and for the purpose hereinbefore set forth.

4. The combination, with the swinging frame and clamping-arms, of the shaft *m*, guide-arms L, central support R, and cam O, substantially as and for the purpose hereinbefore set forth.

5. The combination, with the clamping-arms, provided with concave jaws *f*, of the pivoted self-adjusting rests *e′*, by which the staves are clamped and their edges presented to the cutter-wheel at different angles, according to the width of the staves, substantially as hereinbefore set forth.

6. The combination, with the standards A and concave cutter-wheel, of the swinging stave-supporting frame D, with its pivots *d*, made vertically adjustable in slots in the standard A, to regulate the bilge or curve given to the edge of the stave, substantially as hereinbefore set forth.

EDWARD HOLMES.
BRITAIN HOLMES.

Witnesses:
JNO. J. BONNER,
ERNEST HODDICK.