F. O. Clark.

Stave Machine.

No. 71276. Patented Nov. 26, 1867.

Fig. 1.

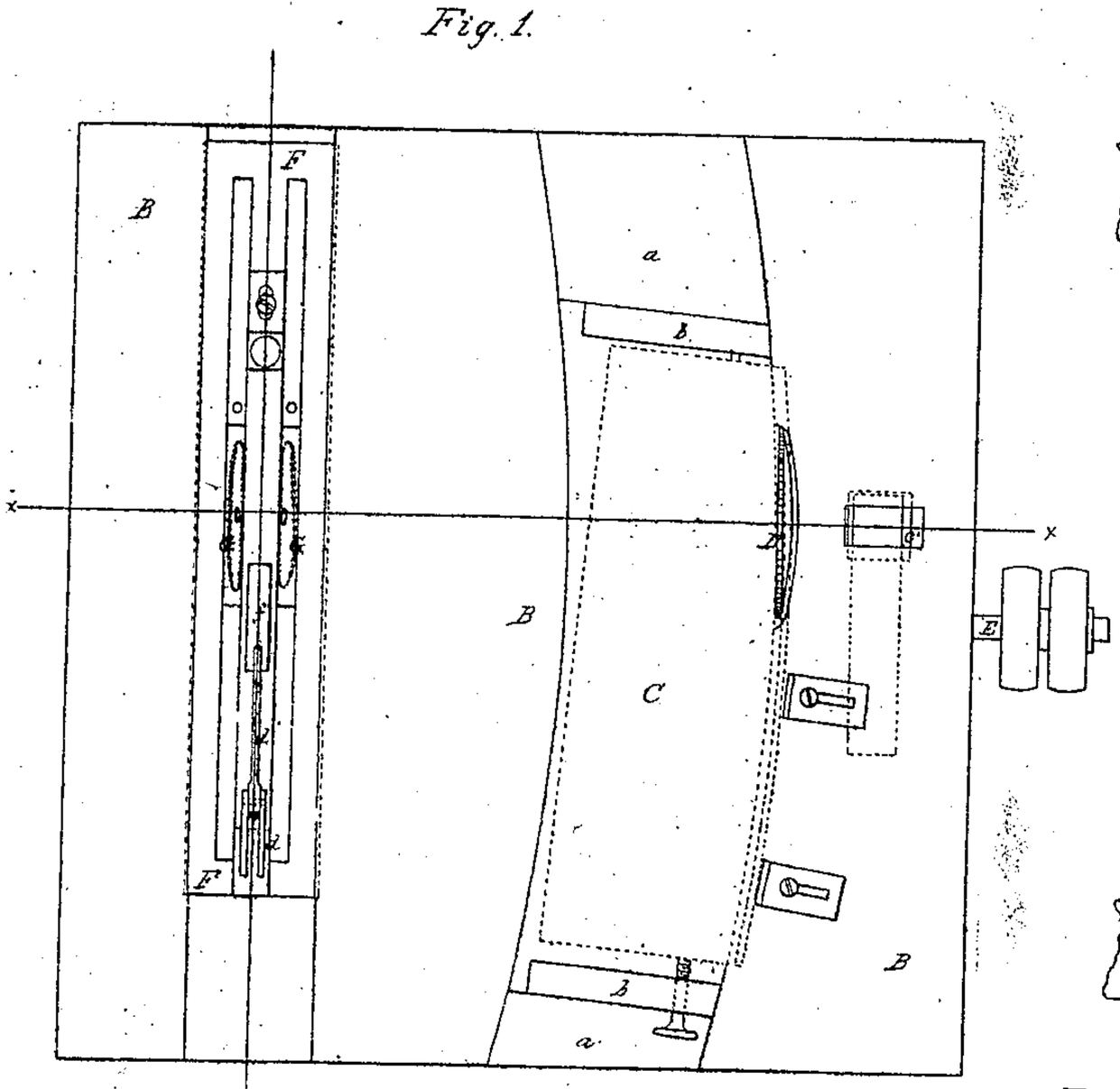


Fig. 2.

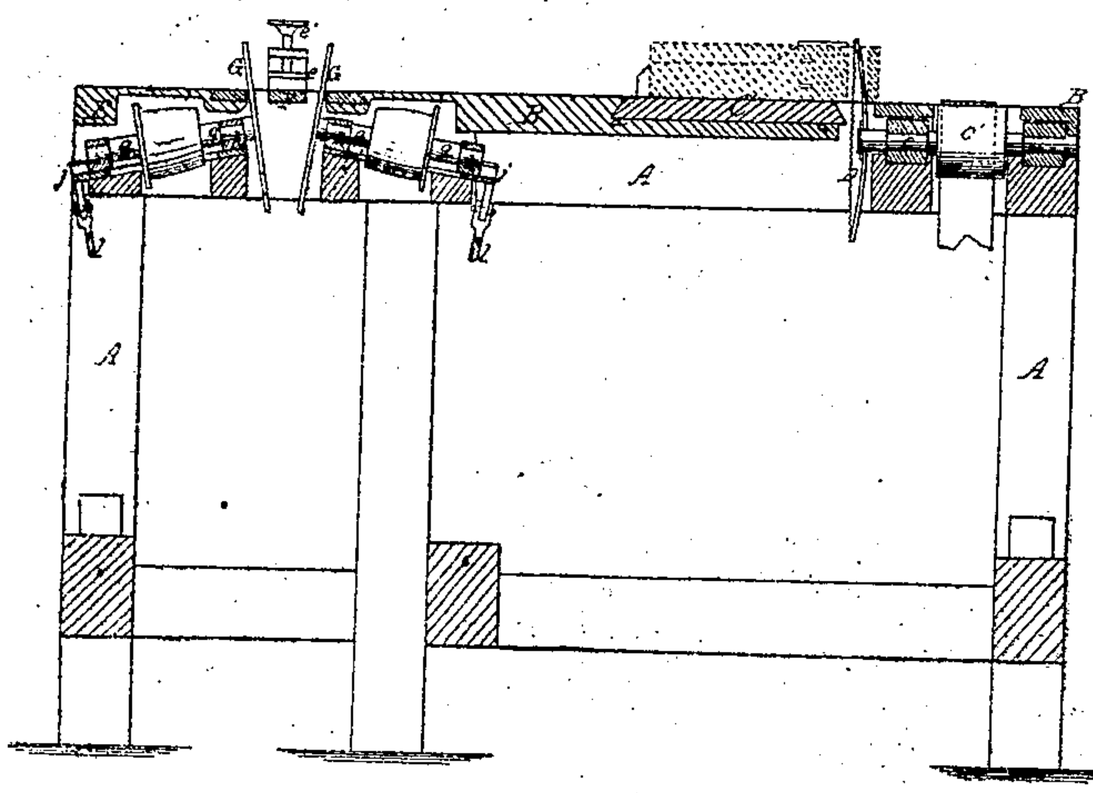


Fig. 4.

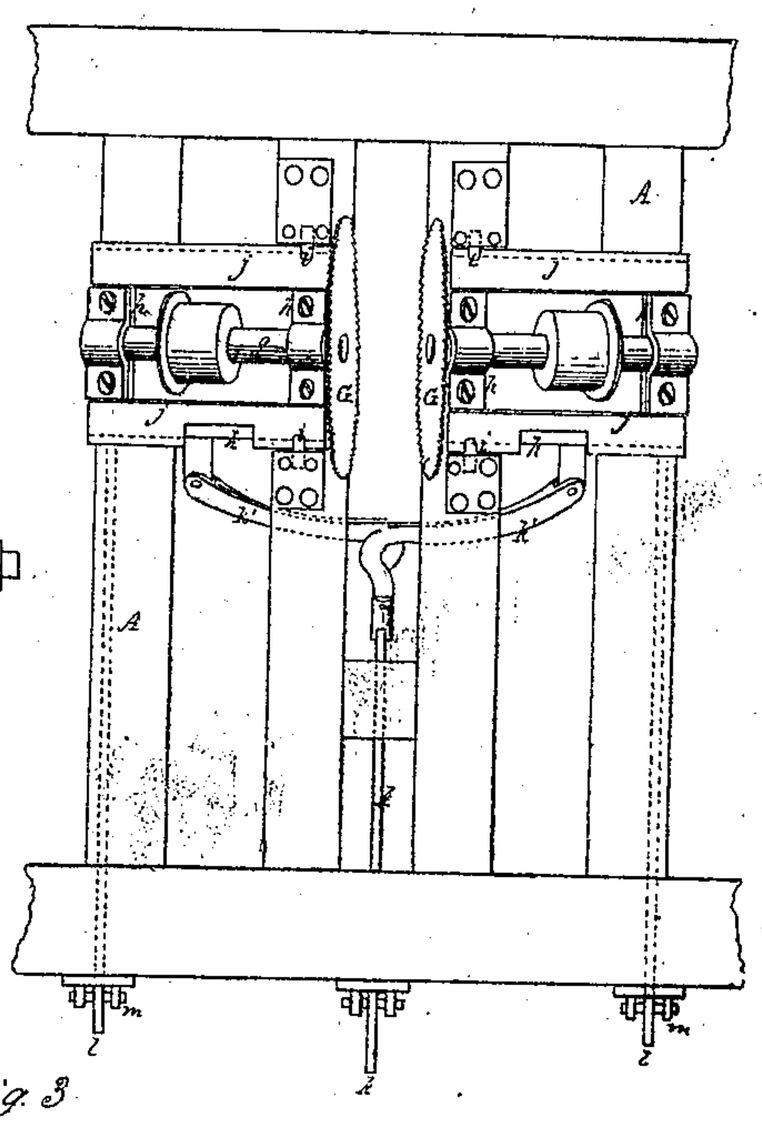
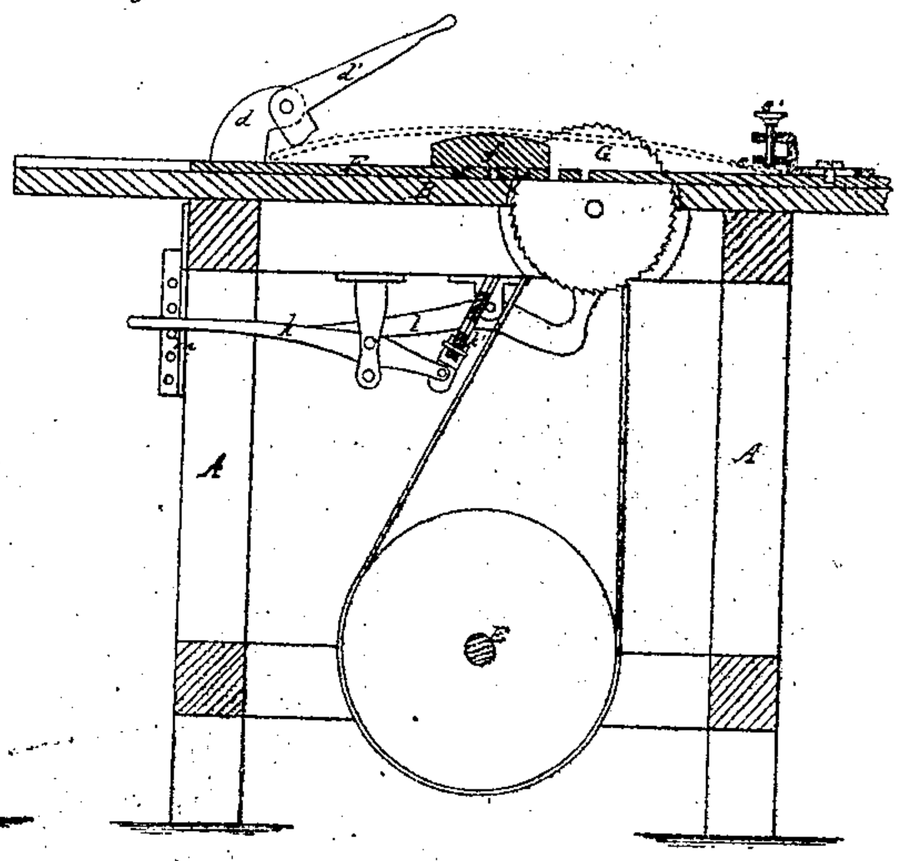


Fig. 3.



Witnesses
R. J. Campbell
Edw. Schaefer

Inventor
F. O. Clark
by
Munn, Dennick & Lawrence

United States Patent Office.

FRANCIS O. CLARK, OF BENTON'S PORT, IOWA, ASSIGNOR TO HIMSELF AND JOHN E. REININGHAUS, OF THE SAME PLACE.

Letters Patent No. 71,276, *dated November* 26, 1867.

IMPROVEMENT IN STAVE-MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, FRANCIS O. CLARK, of Benton's Port, in the county of Van Buren, and State of Iowa, have invented a new and improved Machine for Sawing and Jointing Staves; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a top view of the improved machine.

Figure 2 is a longitudinal section, taken through fig. 1, in the vertical plane indicated by red line *x x*.

Figure 3 is a transverse section through figs. 1 and 2, taken in the vertical plane indicated by red line *y y*.

Figure 4 is a top view, showing the two inclined jointing-saws and their adjustable frames.

Similar letters of reference indicate corresponding parts in the several figures.

This invention is designed for sawing barrel-staves from blocks of the proper curved form, and then jointing such staves so that they will fit neatly together when hooped in the form of a barrel.

The nature of the first part of my invention consists in combining a circular saw, of proper shape, with a circularly movable bed, in such manner that staves can be conveniently, and with great facility, sawed from blocks of wood confined upon said bed, as will be hereinafter explained.

The nature of the second part of my invention consists in the employment of two inclined circular saws upon adjustable frames, in combination with a rectilinear reciprocating carriage, which is provided with means by which the curved staves can be firmly held in about the position they would assume when hooped in barrel-form, and while thus held presented to the inclined saws and their edges properly jointed, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A represents the table or frame upon which the improved devices for cutting staves from blocks and jointing them are applied. Transversely across the top B of the table, a curved groove or channel, *a*, is made, the edges of which are undercut, so as to form a dove-tail groove for receiving the circularly movable slide or carriage C, and keeping this slide down in place. To the ends of the slide C, head-pieces *b b* are secured, between which the blocks from which staves are cut are confined by means of spurs and clamping-screws or other suitable means. The staves are sawed from the blocks confined upon said slide by means of a circular saw, D, which is applied to an arbor, *c*, that has its bearings in journal-boxes applied on top of the frame A, beneath the bed B, as shown in fig. 2. Upon the arbor *c* a pulley, *c'*, is keyed, over which a belt passes, that transmits motion to the saw-arbor from a pulley or drum upon the main driving-shaft E. It will be seen, by reference to the drawings, figs. 1 and 2, that the circular saw D is dished, so that its concave face is presented next the work, thereby causing it to conform to the curvature of the staves and block from which the staves are sawed. The curve which is given to the staves sawed from the blocks by saw D is considerably less than the curve or bulge which these staves are made to take when hooped in barrels. The staves which have been sawed from the blocks are removed to the transversely sliding carriage F, and jointed by means of the two inclined saws G G. The carriage F is slotted longitudinally, so as to receive through it the two saws, and to allow of their being adjusted in different planes, and set to run at different distances apart. Near the front end of the carriage F is a standard, *d*, to which a right-angular clamping-lever, *d'*, is pivoted, the object of which is to bend and hold down one end of a stave while it is being jointed by the saws G G. The other end of the stave is held down by means of the clamp *e*, which is acted upon by the set-screw *e'*. The washer on this screw is made adjustable so as to admit and confine the ends of staves which vary in thickness; and this clamp entire is made adjustable on the table so as to accommodate staves of different lengths. At an intermediate point between the two clamps above mentioned, a block, *f*, is applied, and held in place by means of studs entering holes made through the carriage F, as shown in fig. 3. This block is made removable as well as adjustable;—removable, in order to substitute higher blocks for long staves; adjustable, so as to bring it centrally between the clamps for short staves. By means of said clamps and "bulge" blocks the staves can be secured, one at a time, upon the carriage F, and held in the bent form they are required to take when hooped together in barrels. The staves are thus held while the carriage is moved forward, and the saws G G

dress their edges, or, what is technically termed, joint them. The saws G G are required to be held in planes radiating from a centre, which would coincide with the centre of the barrel which it is desired to make. These saws are fast upon the ends of arbors *g g*, which have their bearings in rectangular frames *h h*, that incline in opposite directions, as shown in figs. 2 and 4. The saw-frames are supported in guide-frames *j j*, so that the former can be adjusted in a direction with the length of the saw-shafts by means of lever *k;* and these guide-frames are supported upon the table-frame A by means of trunnions *i i*, so that the saw and guide-frames can be raised or depressed at their outer ends, and the saws adjusted and set to work at any given angle with respect to the table-top. The lever *k*, by means of which the saws and their frames *h h* are adjusted nearer together or set further apart, according to the width of stave to be jointed, is connected to the saw-frames by means of jointed links *k' k'*, acting like toggle-levers. These links are of a bell-crank form, or nearly so, in order that their angle or corner may be nearly as high as the pivot by which they are connected to the straight moving inclined bearings or frames *h h*, and thus produce a thrust upon said frames nearly in a line with the direction in which the bearings or frames move. The outer ends of the guide-frames *j j* are raised or depressed by means of levers *l*, which pass through slotted hangers *m*, at the front of the table A, and are held fast by means of pins passed through said hangers. Lever *k* is similarly secured when the saws are adjusted at the proper distance apart. The arbors *g g* are rotated by means of belts passing over pulleys, which are on these arbors, and on the main driving-shaft E.

It will be seen from the above description that I first saw the staves from blocks or bolts, of a form approaching that which they are required to take when hooped together. I then bend and clamp the staves or stave-blanks upon a sliding carriage, and run them between two properly inclined saws, which give the required bevel or joint to the edges of the staves, so that when put together they will fit snugly and tightly. The two operations are conducted upon the same table, and by means of saws which are rotated by a single driving-shaft, with belts for transmitting the motion, as above described.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The curved carriage C, fitted into a channel of the table B in the relation to a dish-saw, and flush with the top of the table, the said carriage and table constituting parts of a stave-sawing machine, and the carriage being provided with head-blocks, a clamping device, and the table with gauges, all substantially in the manner and for the purpose herein described.

2. The table B of a stave-sawing machine, with a channel of curved form horizontally, and of a dove-tail form vertically, cut down into it so as to form a depressed bed for the carriage C, and also guides therefor, substantially as and for the purpose set forth.

3. Jointing-saws, mounted on inclined arbors, which are supported upon straight moving-endwise adjustable bearings *h h*, which are operated by the devices shown, or the equivalents thereof, substantially as described.

4. The jointing-saws, mounted upon inclined arbors, which are supported upon straight moving-endwise adjustable bearings *h h*, which are operated by the devices shown, or their equivalents, in combination with the vertically vibrating frames *j j*, operated by the devices shown, or their equivalents, substantially as described.

5. The combination of the straight moving-endwise adjustable bearings or frames *h h*, carrying inclined arbors with jointing-saws upon them, the toggle-joint, formed of bent links *k' k'* and the lever *k*, for the purpose of adjusting the saws at any desired distance apart, without changing their angle of inclination, substantially as described.

6. Providing for both adjusting the saws farther apart without changing their angle of inclination, and for changing the angle of inclination, when desired, in the one machine, by the means substantially as described.

7. The adjustable clamp *e e'*, for accommodating one of the ends of different thicknesses of staves, in combination with the lever-clamp *d'*, substantially as described.

8. Making the bilge-block both removable and adjustable between the clamps *d' e'*, for the purpose of bilging different lengths of staves, substantially as described.

Witnesses:

EDW. SCHAFER,

EDM. F. BROWN.

FRANCIS O. CLARK.