

(No Model.)

3 Sheets—Sheet 1.

J. SPAULDING, Jr.

STAVE JOINTER.

No. 261,179.

Patented July 18, 1882.

Fig. 3.

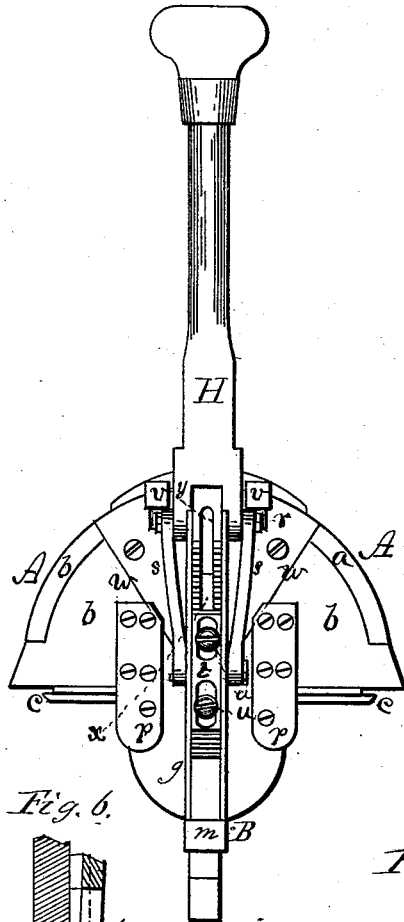


Fig. 1.

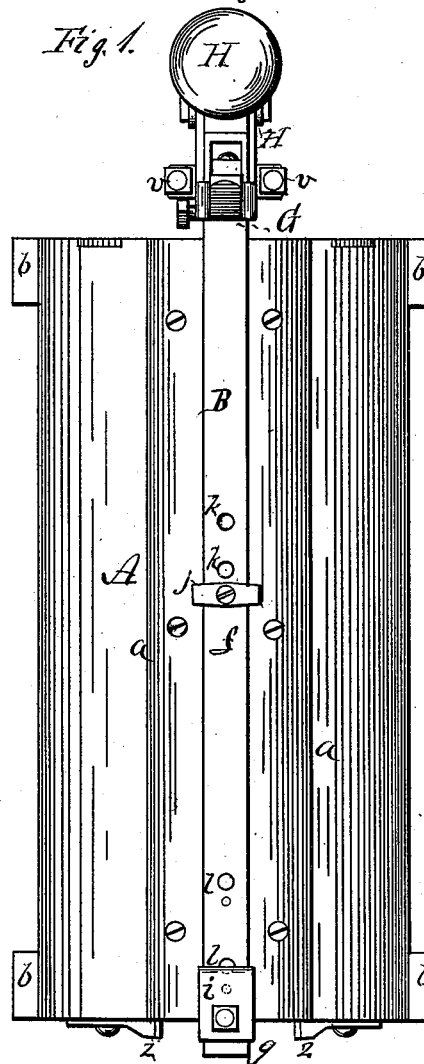


Fig. 6.

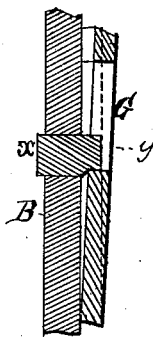
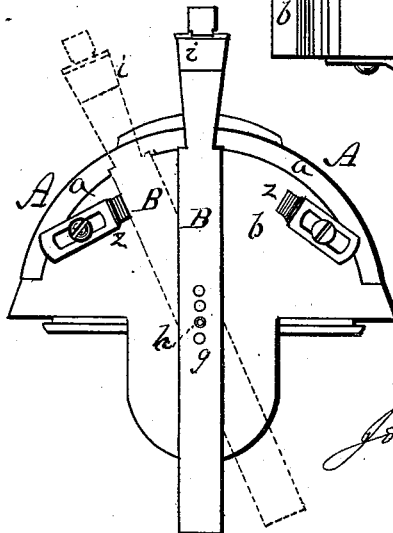


Fig. 4.



WITNESSES

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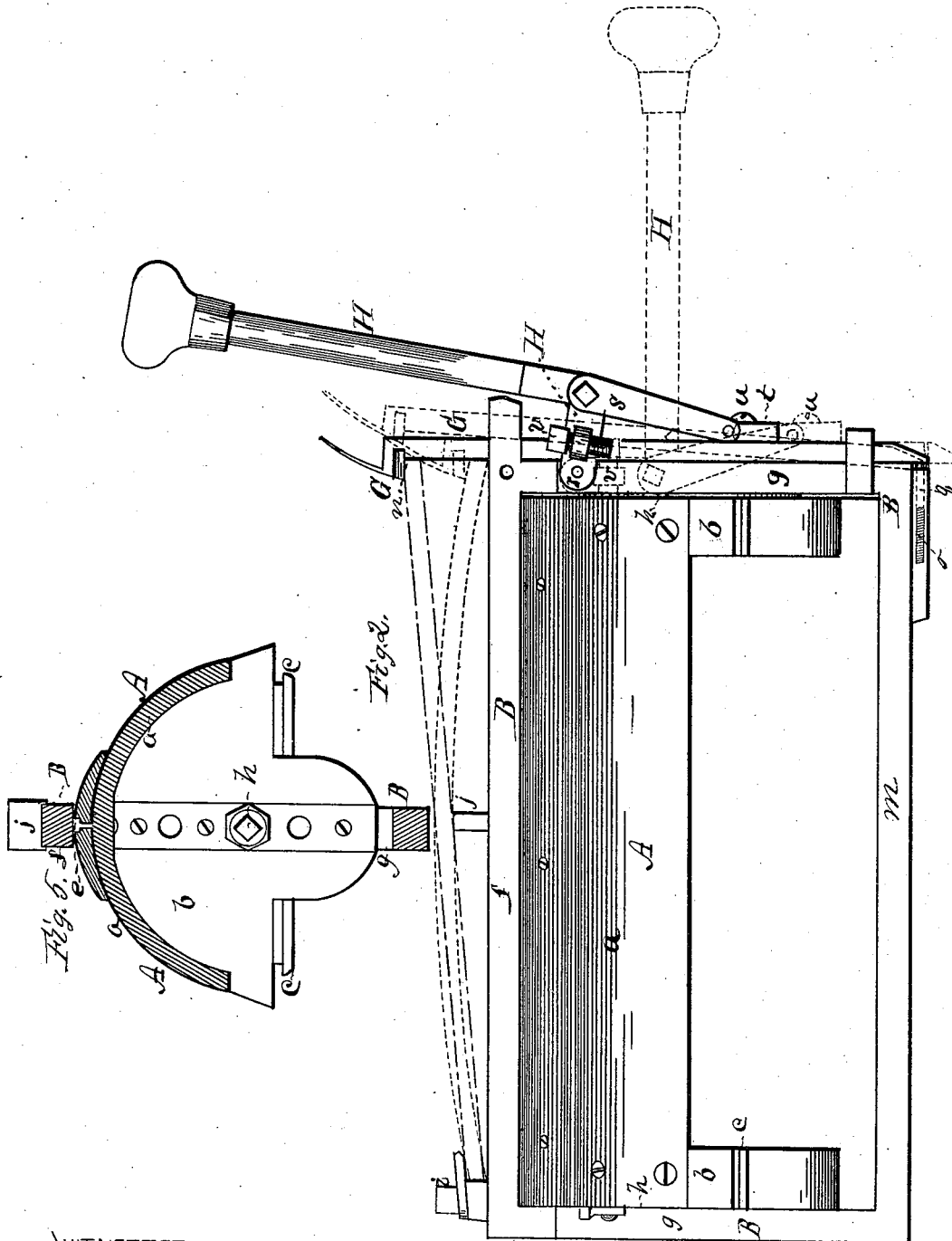
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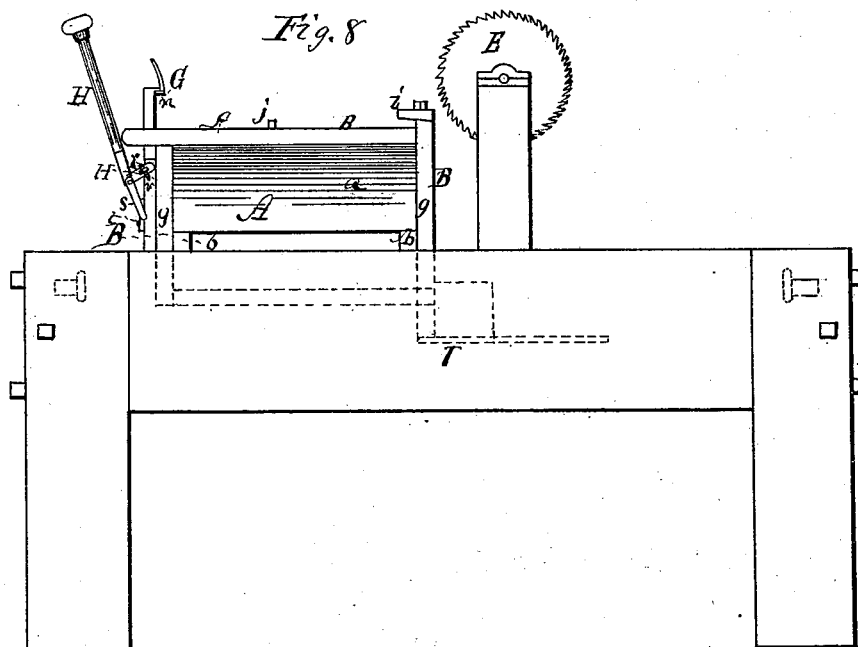
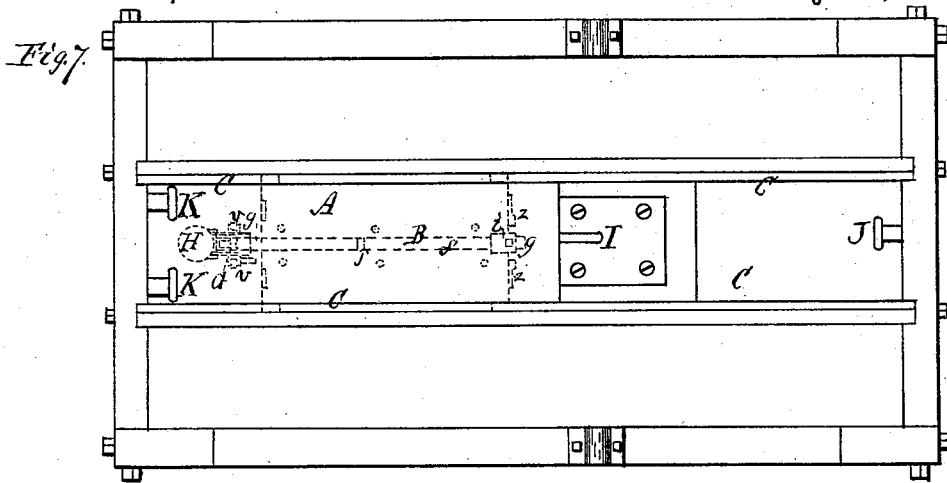
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UNITED STATES PATENT OFFICE.

JONAS SPAULDING, JR., OF TOWNSEND, MASSACHUSETTS.

STAVE-JOINTER.

SPECIFICATION forming part of Letters Patent No. 261,179, dated July 18, 1882.

Application filed April 3, 1882. (No model.)

To all whom it may concern:

Be it known that I, JONAS SPAULDING, JR., of Townsend, in the county of Middlesex and State of Massachusetts, have invented an Improved Stave-Jointer; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification—

10 Figure 1 being a top view of the sliding carriage or "bunk" and swinging stave-holding bar thereon, together forming the principal part of the machine; Fig. 2, a side view of the same; Fig. 3, a front end view thereof; Fig. 4, 15 a rear end view thereof; Fig. 5, a cross-section of the same; Fig. 6, a view of a part thereof detached; Fig. 7, a top view of the entire machine, showing the carriage in place; Fig. 8, a side view of the same.

20 Like letters designate corresponding parts in all of the figures.

My invention belongs to that class of stave-jointers in which the stave is first bent to the proper curve to form the bilge of the vessel intended to be made, and then jointed by a 25 saw or cutter cutting in a radial plane corresponding with that of the vessel of which the stave is to form a part.

My improvement comprises several features 30 in such a machine designed to make the staves accurately of equal widths at the two ends, (when the vessel is to be of equal diameters at the two ends,) to make a smooth, close-fitting, and exactly radial joint, and to produce a simple, convenient, and easily and rapidly handled machine at small cost. These several 35 features of improvement will be herein successively described and claimed.

The sliding carriage or bunk A, to which 40 belong the first features of my invention, I find it preferable to make of approximately cylindrical form and of wooden staves, or a peripheral deck, *a*, secured at the ends to wooden heads *b b*, substantially as shown in the drawings. This forms a firm light carriage, and 45 one that the operator can rest his hand on conveniently when fixing the staves in the clamp-bar or holder B, mounted on the carriage, and thus facilitate a correct setting of the same. 50 This wooden carriage has or may have suitable iron mountings for strengthening the same,

and for attaching the swinging bar or holder B thereto and controlling its motions thereon and use in other connections, the special uses of which mountings will be pointed out in the 55 proper places. Thus, first, there are clips *c c* at the four corners of the carriage, respectively under the lower corners or extreme ends of the heads *b b*, substantially as shown, to clasp under two ways, C C, on the main frame D of 60 the machine, and on which the carriage A traverses, and thereby to hold the carriage securely and accurately in place as it is caused to slide along under the jointing-saw E, mounted on the said frame or otherwise.

Centrally and longitudinally in the top of 65 the carriage is formed a groove, *e*, Fig. 5, wide enough for the tooth of the saw to run in freely, and the points of the saw-teeth enter this groove as the carriage moves along under the 70 saw. This groove not only enables the carriage and its appendages to be brought as closely as practicable to the saw, but it serves as a guide to enable the operator to accurately clamp each stave on the swinging clamp-bar 75 B, so as to waste no material or time unnecessarily, and not to set the stave thereon at random.

The swinging clamp-bar or holder B (properly made of iron) is a rectangular frame, as 80 shown, just long enough to embrace the carriage A longitudinally and be free to swing or oscillate around the same, the upper side, *f*, swinging as closely as desirable over the upper surface of the carriage. A suitable mode of 85 mounting and pivoting the swinging bar thus on the carriage is represented in the drawings, consisting of two pivots, *h h*, screwed from the inside through the heads of the carriage, and entering holes or bearings in the ends *g g* of 90 the clamp-bar, respectively. There are or may be several of these holes or bearings at regular distances apart in the ends of the clamp-bar, for increasing or diminishing the radius described by the clamp-bar, according to the 95 diameter of the vessels to be made from the staves; and the pivots may be adjustable to different positions in the heads of the carriage, and different swinging bars varying in width may be employed in the fulfillment of this 100 purpose.

The staves are clamped, bent for the bilge,

and held thus in place upon the upper side, *f*, of this clamp-bar. At the rear end of this side of the clamp-bar is a fixed hook or clip, *i*, under which is placed one end of each stave to be jointed, and the other end is held by a movable clamp-hook, *G*, while midway between the hooks is a prop or fulcrum-block, *j*, projecting upward from the side *f* of the clamp-bar as high as necessary to give the required bend or bilge to the stave while jointing it. This fulcrum-block is removable and changeable for different work, and it also is adjustable to different positions, as indicated by the different holding-sockets *k k*, Fig. 1, to adapt it to different lengths of staves, the fixed hook *i* also being adjustable to different positions for the same purpose, as indicated by the adjusting-sockets *l l* in the same figure. The fulcrum-block is but a little wider than the clamp-bar, and wide staves bent over it not only are bent longitudinally, but are curved laterally, so that the correct bilge is given to the staves while jointing them, whatever may be their width.

The construction and operation of the movable clamp-hook *G* are peculiar and important, and will now be specified.

The clamp-hook reaches across the width of the swinging clamp-bar *B* at the end thereof next to the operator, projecting beyond the same both upward and downward. It has a longitudinal movement up and down, sliding in guide-mortises, respectively, in the projecting upper side, *f*, and in the projecting end of the lower side, *m*, of the clamp-bar, substantially as shown in the drawings. The mortise in the side *f* is long enough to permit a lateral movement backward and forward of the clamp-hook, equal, say, to the amount of projection of the holding shoulder or catch *n* of the said clamp-hook. This allows the clamp-hook to swing back to allow the placing of the end of the stave under the catch after the other end of the stave has been secured under the fixed hook *i*. The clamp-hook is sprung forward over the end of the stave by a spring, *o*, Fig. 2, which, for convenience, is held in a tubular socket or holder on the bottom of the lower side, *m*, of the clamp-bar, a piston or plug, *g*, sliding in the tube and bearing, being by the spring pressed against the lower end of the clamp-hook below the lower holding-mortise thereof, which serves as a fulcrum to the clamp-hook, so that the upper end of the same is pressed forward with the necessary force over the stave. This clamp-hook is first raised high enough to catch over the raised end of the stave, (the position of which at first is indicated by heavy dotted lines in Fig. 2,) and is then forced directly downward till the end of the stave is brought down to the upper side, *f*, of the clamp-bar, bending the stave into proper shape for jointing it, as indicated by light dotted lines in the same figure. The following device for producing these clamp-hook movements constitutes a special feature of my invention:

To the adjacent end *g* of the swinging bar *B* a bent lever, *H*, is pivoted at *r*, near the upper extremity thereof. This lever has a bend at a short distance from its pivoted end, and at this bend an arm, *s*, (or arms,) is pivoted, the other end of the arm being also pivoted to a block, *t*, which is firmly secured to the clamp-hook. The short arm of the bent lever and the connecting-arm *s* together form a toggle-joint for forcing down the clamp-hook with the required power, as indicated in the drawings.

The toggle-arm *s* might be pivoted directly to the clamp-hook; but for the purpose of adjustment, so as to bring the lever into proper positions for operating and to suit different thicknesses or different degrees of bilge of the staves, the block *t* is employed, and it is secured to the clamp-hook adjustably by screws *u u*, which pass through longitudinal slots or notches in the block and hold in the clamp-hook. Besides, the contiguous surfaces of the block and clamp-hook are finely cross-creased or otherwise roughened to prevent any possible slipping of the one on the other under the powerful force of the toggle-joint and lever.

The form and positions of the lever are substantially shown in Fig. 2, the position of the lever when raised to bring the clamp-hook over a stave to be jointed being shown in full lines, and its position when the stave has been bent and the lever brought into place for pushing the carriage under the saw for jointing the stave being shown by dotted lines. This position is a little past that which is required to clamp the stave in place; but the lever is caused to move a little farther beyond the dead-point of the toggle-joint for two purposes—first, to retain the clamp-hook in its previously-forced position without continual effort on the part of the operator, and for performing another function, that of holding the swinging clamp-bar *B* immovably in the proper position while jointing the stave. For this purpose one or two screws or adjustable stops, *v v*, are inserted in the lever, and are arranged to bear against the end of the carriage as the lever is pressed downward, thus causing sufficient friction by the contact to hold the swinging bar securely against lateral displacement while jointing the stave. A Y-shaped or other suitable form of iron mounting, *w*, Fig. 3, is or preferably may be secured to the end of the carriage, both to strengthen the carriage and for the stops *v v* to bear against and not abrade the wood of the carriage.

The upper end of the clamp-hook *G* is thrown back to unclamp the jointed staves and for the ready admission of staves to be jointed by means of a cam-projection, *x*, on the adjacent end *g* of the swinging bar, a slot, *y*, in the clamp-hook embracing the same without coming in contact therewith, except just as the clamp-hook is raised nearly to its highest position, when the lower end of the slot *y* strikes and rises upon the inclined lower end of the projection and causes the clamp-hook to be

pushed back to the position required, as shown particularly in Figs. 2 and 6.

On the forward end of the carriage A are secured two adjustable stops, *zz*, against which the swinging bar B strikes to limit the lateral swinging movement thereof either to the right or the left. These are not mere stops only, but they serve other purposes, as will be understood by a statement of the mode of operating this apparatus. Thus at the start, by resting the swinging bar B on one of these stops, it is held firmly in place while inserting a stave in the clamps thereof. The swinging bar is then raised, if required, to bring the stave in proper position before the saw to joint off one edge of it, the groove *e* in the top of the carriage serving as a guide to a proper adjustment of the stave in position for jointing. The lever H is then brought down as far as it can be till the stops *vv* touch and bear firmly against the end of the carriage. The carriage is then pushed forward, the operator still holding and bearing on the lever to move the carriage forward under the saw. The lever is then slightly raised to free the stops from contact with the carriage, but still held down far enough to hold the stave clamped, and the swinging bar is then swung over to bring the other edge of the stave into position for jointing off. The lever-stops *vv* are then again tightened against the carriage for jointing off the second edge of the stave in the same manner as the first edge thereof. As soon as the carriage is a second time brought back the lever is raised to unclamp the stave, and the swinging bar is swung over till it strikes one of the stops *zz*, when the shock or jar from the contact throws off the stave without its being touched by hand. Another stave is then clamped on the swinging bar, and the operation is repeated. Thus the operation of jointing staves with this apparatus is very convenient and expeditious.

It remains to set forth the construction and arrangement of a safety-stop, I, which is properly secured to or mounted in the frame of the machine in a proper position, substantially as shown in Figs. 7 and 8. Its position and thickness are such that the swinging bar will not fail to strike it and prevent the pushing forward of the carriage whenever the position of the swinging bar is so nearly vertical that it would strike the saw if moved forward, and

thereby save the saw from damage; but in every safe position of the swinging bar this safety-stop does not interfere with the forward movement of the carriage. Other stops, as at J K, serve to limit the forward and backward movements of the carriage within the proper range, there being iron projections *pp*, Fig. 3, on the end of the bunk to strike the stops K K.

I disclaim equally adjustable clamp-hooks at the ends of the stave-holder in connection with a fulcrum-block in the middle of the holder which is not adjustable.

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

1. The carriage A, constructed with the convex form and guide-groove *e*, in combination with the swinging clamp-bar B and saw E, substantially as and for the purpose herein specified.

2. The swinging clamp-bar B, in combination with the carriage A, the said clamp-bar embracing the carriage and pivoted at adjustable centers thereto, substantially as and for the purpose herein specified.

3. The fixed clamp-hook *i* and fulcrum-block *j*, in combination with the operative clamp-hook G, the said fixed hook and block being adjustable to proportional distances from the hook G on the swinging bar B, substantially as and for the purpose herein specified.

4. The movable clamp-hook G, arranged to slide up and down at the end of the swinging clamp-bar B, and to have a backward and forward swinging movement at its upper end, in combination with the fixed clamp-hook *i* and fulcrum-block *j*, substantially as and for the purpose herein specified.

5. The adjustable stops *vv* on the lever H, in combination with the swinging bar B and carriage A, substantially as and for the purpose herein specified.

6. The cam-projection *x* on the swinging bar B, in combination with the sliding clamp-hook G, provided with the slot *y*, the lever H, toggle arm or arms *s*, and counter-spring *o*, substantially as and for the purpose herein specified.

JONAS SPAULDING, JR.

Witnesses:

JONATHAN TILTON,
SAMUEL B. GIBSON.