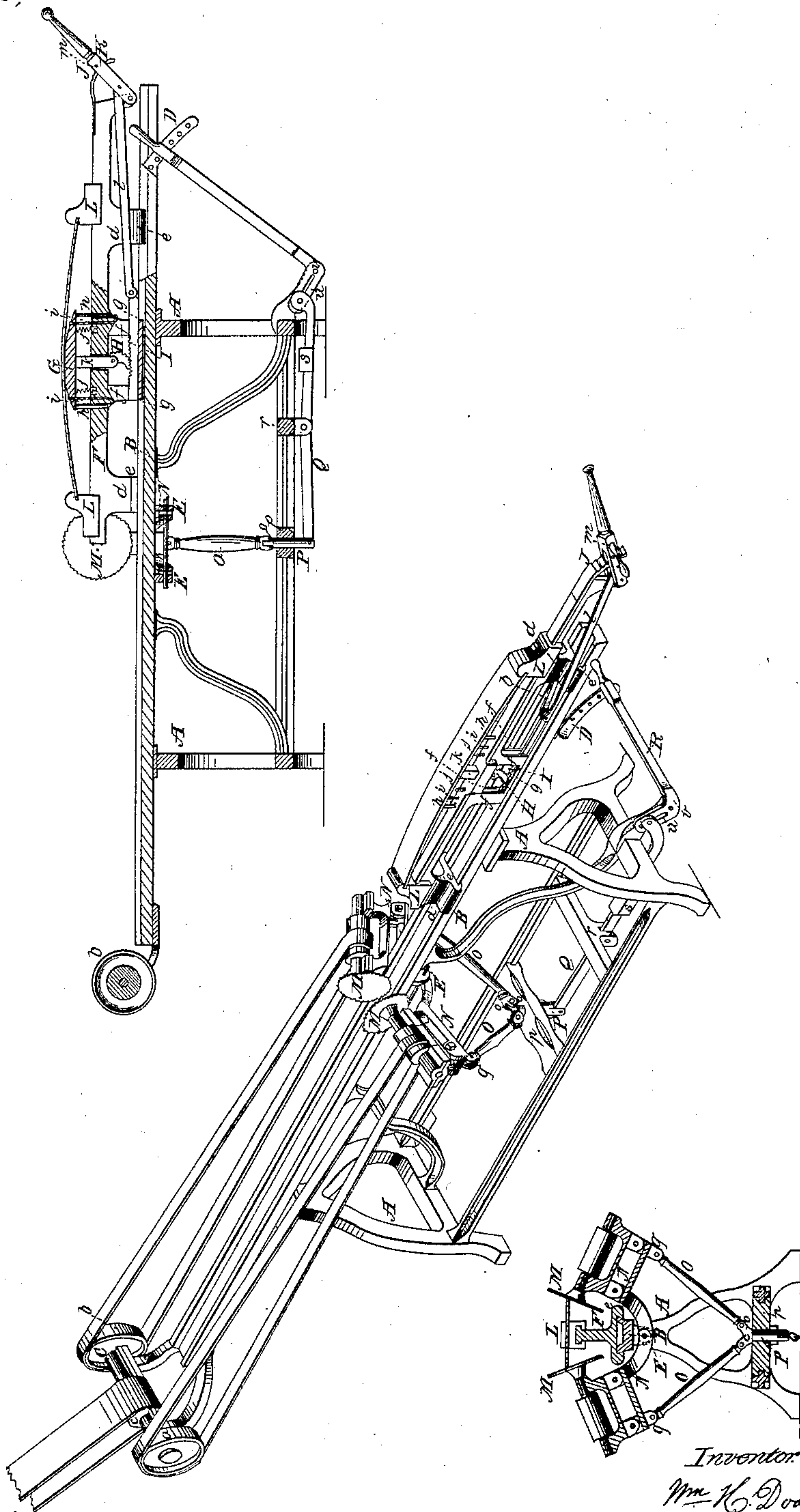


*W. H. Doane,
Jointing Stares,*

N^o 37,858,

Patented Mar. 10, 1863.



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UNITED STATES PATENT OFFICE.

WILLIAM H. DOANE, OF CINCINNATI, OHIO.

IMPROVEMENT IN SAW STAVE-JOINTERS.

Specification forming part of Letters Patent No. 37,858, dated March 10, 1863.

To all whom it may concern:

Be it known that I, WM. H. DOANE, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Saw Stave-Jointers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings of the same, forming part of this specification, in which—

Figure 1 is a perspective view of a saw stave-jointer with my improvements applied to it. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a vertical transverse section of the same.

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

My improvements relate to saw stave-jointers which operate with two adjustable obliquely-setting saws against the edges of a stave, which is sprung to the proper bulge by means of a rising platform of the carriage and a vertical bar of a foot-lever.

The novelty of my invention consists, first, in its capability of springing the stave in the carriage during any stage of its progress between the saws, or while the carriage is at any point on the bed-plate, by the actuation, simply, of a lever connected with bending mechanism; second, in the adjustable cam-gear and rack or equivalent devices for springing the stave in the center to the desired bulge previously to passing it through the saws, or at any period while it is in the carriage; third, in the combination of a curved ratchet-toothed spring, hand-lever, stop-pin, connecting-rod, sliding rack, cam-gear, and adjustable bender or bed, so that after the stave is sprung it will be held in that condition, and any movement made in the hand-lever simultaneously with a depression of the toothed spring will release the parts which hold the stave in bulge; fourth, in connecting the angular posts which support the outer end of the frames on which the saw-arbors rest to a central double-hinging upright, and connecting the inner ends of the saw-arbor frames to a central longitudinal hinge-rod, so that the saws may more perfectly be raised or lowered to any desired angle; fifth, in the combination of the horizontal lever, with or without a compen-

sating, weight, and the central double hinging upright and saw-arbor frames, so as to aid in adjusting the saws; sixth, in the combination of the angular slotted spring-lever, curved stop-plate, and the vertically-acting lever, so that the saw-arbors may be adjusted by hand, and held stationary at the desired angle after being thus adjusted; this combination answering for adjusting and holding both saws at one and the same time.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation with reference to the drawings.

A is the main frame, with grooved bed-plate B mounted upon it, the groove being formed by two right angled or nearly right-angled ways raised on the edges of the bed-plate and extending laterally therefrom.

C is the counter-shaft, with pulleys *a b c* arranged on it. This shaft is at the rear end of the bed-plate.

D is a curved arm extending out from one side of the front end of the bed-plate. This arm is perforated with small holes, as shown.

E E are vertical hinging-lugs projecting down from the central part of the bed-plate, as shown.

F is a carriage in form of an elevated T-rail with a vertical pillar, *d*, at each end, said pillars having a shoe, *e*, at their bases, and being grooved on the under side of said shoe portion, so as to fit over and under the angular rails of the bed-plate B, as shown. Between the pillars an unobstructed space exists, except near the center of the carriage, at which place narrow brackets *f f* project down from the under side of the carriage, and terminate in a longitudinal guide, *g g*, which barely touches the surface of the grooved portion of the bed-plate. Through the top of the carriage several small holes are punched, and in the two holes which are farthest from the center of the length of the carriage guide-pins *h h* are arranged, and upon these pins a curved former or stave-bender, G, is mounted and fastened. In the next two holes, which are slightly nearer to the center of the length of the carriage, spring-bands *i i* are arranged loosely, the lower ends of the bands being fastened to the under side of the carriage-rail,

and their upper ends attached to the under side of the former or bender. In the next pair of holes, which are still nearer the center of the length of the carriage, spiral springs *j j* are fitted, said springs resting against shoulders of the holes, and thrusting against the under side of the former or bender *G*. The effect of the springs *j j* is just the converse of the bands *i i*, the former serving to aid in raising the bender *G*, and the latter serving to lower it. In the central square hole a vertical follower, *k*, is fitted loosely. Said follower is attached at its upper end to the bender *G*, and by its lower end is pivoted to a cam-gear, *H*, as shown. The follower moves up and down and carries the bender *G* with it accordingly as the cam-gear is actuated.

To actuate the cam-gear, a rack-bar, *I*, with cog-teeth on its top, is arranged under said gear in the longitudinal guide *g g*. To the front end of this bar connecting-rods *l l* are pivoted, said rods being arranged on opposite sides of the rail of the carriage, and extending from the rack-bar *I* to the front end of the rail of the carriage, and there are pivoted to a hand-lever, *K*, which has its fulcrum on the front lower extension of the said rail. The lever *K* is slotted through from front to rear a suitable distance from its lower end, so as to admit the carriage to extend through it a short distance. By moving the lever right and left the rack bar is reciprocated, and, the teeth of the bar being long enough to gear with the teeth of the cam, motion is imparted to the cam and it is caused to raise or lower the follower and bender, accordingly as the lever is moved.

In order to retain the parts in any desired position after adjustment is made, a curved ratchet-toothed spring, *J*, is extended out and on a curved line below the rail of the carriage, it being fastened to the top of said rail, and made of a width which will allow the lever to move around it. Just above the spring *J* a pin, *m*, is inserted through the slotted portion of the lever. This pin slips with frictional contact over the toothed spring, and by its contact slightly depresses the spring, and therefore when the pin gets behind the notch which gives the proper adjustment it, if allowed, falls into said notch and retains the parts in position. The carriage is furnished, on opposite sides of the bender, with clamping-wrists *L*, which are adjustable, to accommodate staves of differing lengths. These wrists are fitted, by means of a groove and angled ledges on their under side, to the T-rail portion of the stave-carriage, and are constructed with grooves in their inner ends to admit the ends of the stave. Set-screws fasten the wrists in position after the stave is bulged and clamped.

M M are circular saws for jointing the two edges of the stave at the same time. The arbors of these saws are arranged in boxes of

yoke-shaped supports, which are mounted upon yokes *N N*, as shown. These yokes are hinged, so as to stand at an angle, to the lugs *E E* of the main frame, and at their outer ends are pivoted, as at *q q*, to angular or oblique posts *O O*, which are also hinged at their lower ends to a double-hinging head, *o o*, of a vertical central post, *P*, as shown, said central post being fitted loosely in a cross-tie, *p*, of the frame *A*, so as to be capable of moving up and down freely, and in so doing it produces a movement of the yokes on its hinge-connections with the frame and oblique posts, and thus effects a simultaneous adjustment of the two saws to a greater or less angle, accordingly as the post moves.

Q is a vertically-acting horizontal lever, pivoted at the center of its length to a cross-tie, *r*, of the main frame, and at its rear end to the bottom of the post *P*. The front end of this lever may carry a compensating-weight, *s*, and is connected by a pivot to the slotted end *u* of an angular yielding lever, *R*, which is pivoted to the main frame, as at *v*. The upper end of this lever has a stop-pin extending from its side, said pin entering, accordingly as the lever is adjusted, holes in the curved arm *D* of the main frame.

Operation of the machine: Belts attached from counter-shaft pulley to saw-arbor pulleys communicate speed and motion to the saws. The stave to be jointed is placed sidewise in the wrists. Then by pulling back the hand-lever *K* the rack is drawn back and the toothed cam caused to revolve and raise the bender and spring the stave in the center any height desired. Then by taking hold of the handle of the lever *K* the carriage is passed between the saws and the stave jointed. If the stave is too narrow for the distance between the saws, by throwing forward the spring-lever *R* the saws are adjusted to fit the bevel and bulge of the stave with perfect accuracy. It will be seen that after the stave is sprung the narrowest distance between the saws corresponds to the narrowest parts of the stave, and the widest distance to the widest parts of the stave. Thus a proper bulge or bilge is insured.

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

1. Springing or bending the stave in the carriage during any stage of its progress between the saws or at any point on the bed-plate by the actuation of simply a lever connected with bending mechanism, and without adjusting the carriage to a certain position relatively to a bending-bar, substantially as set forth.

2. The cam-gear and rack, or their equivalents, arranged to move with the carriage, and operating substantially as herein described, for the purpose set forth.

3. The combination of the curved spring-stop, hand-lever, sliding rack, and bender, substantially as and for the purpose described.

4. Adjusting the pitch of the saws by means

of a combination of a horizontal axis with a vertical sliding post, substantially as and for the purpose described.

5. The combination of the horizontal lever, vertical double-hinging post, and saw-arbor frames or yokes, substantially as described.

6. The angular slotted spring-lever R, curved stop-plate, and vertically-acting lever Q, in

combination with the double-hinging vertical post for maintaining the desired pitch of the saws, substantially as described.

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Witnesses:

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