

A. H. GETTEL.
Boring and Tenoning-Machines.

No. 146,668.

Patented Jan. 20, 1874.

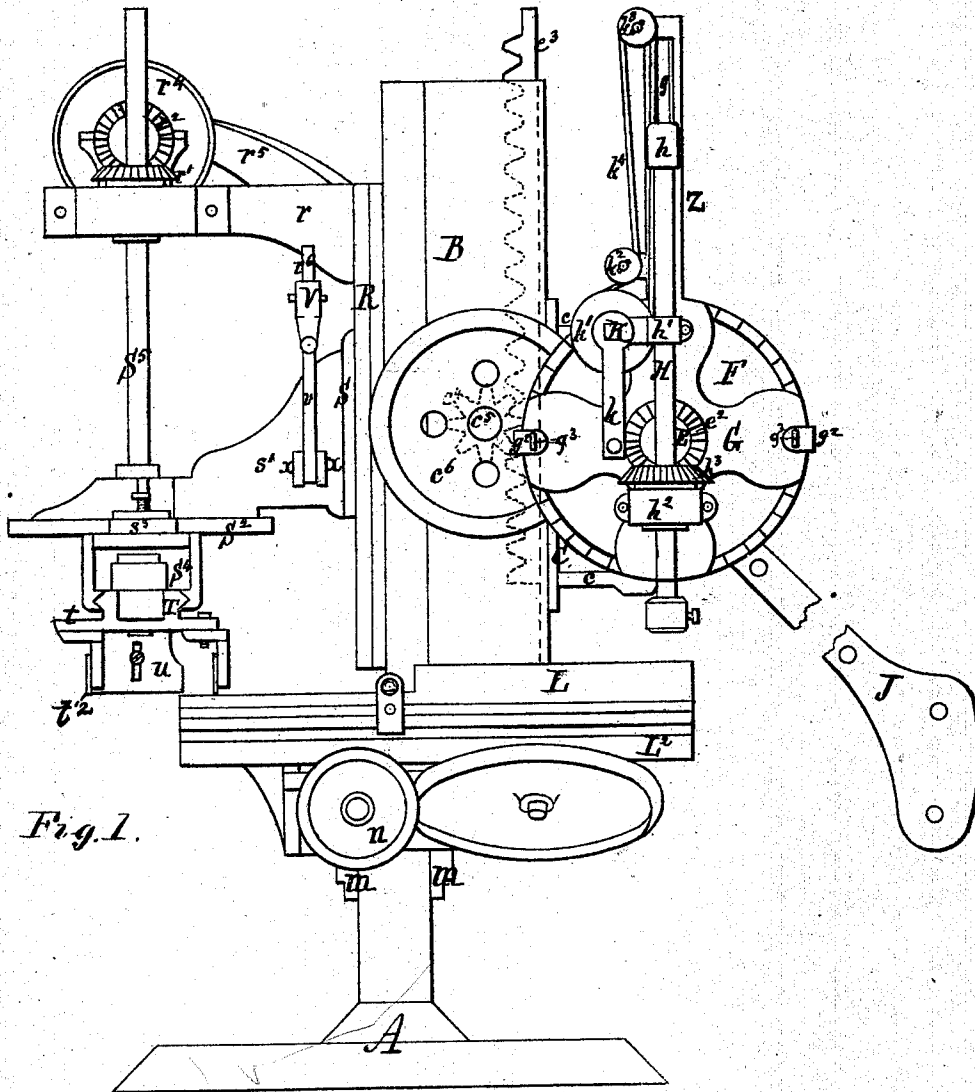


Fig. 1.

Witnesses.
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Chas. B. Steele

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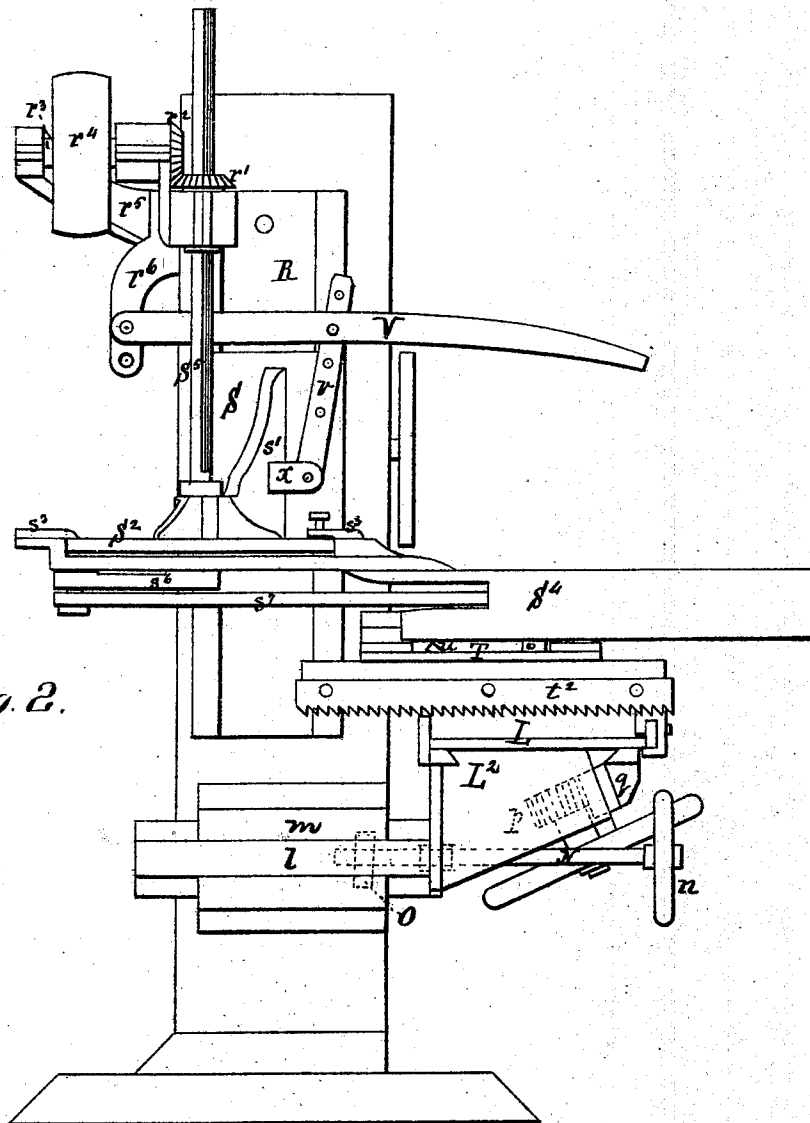


Fig. 2.

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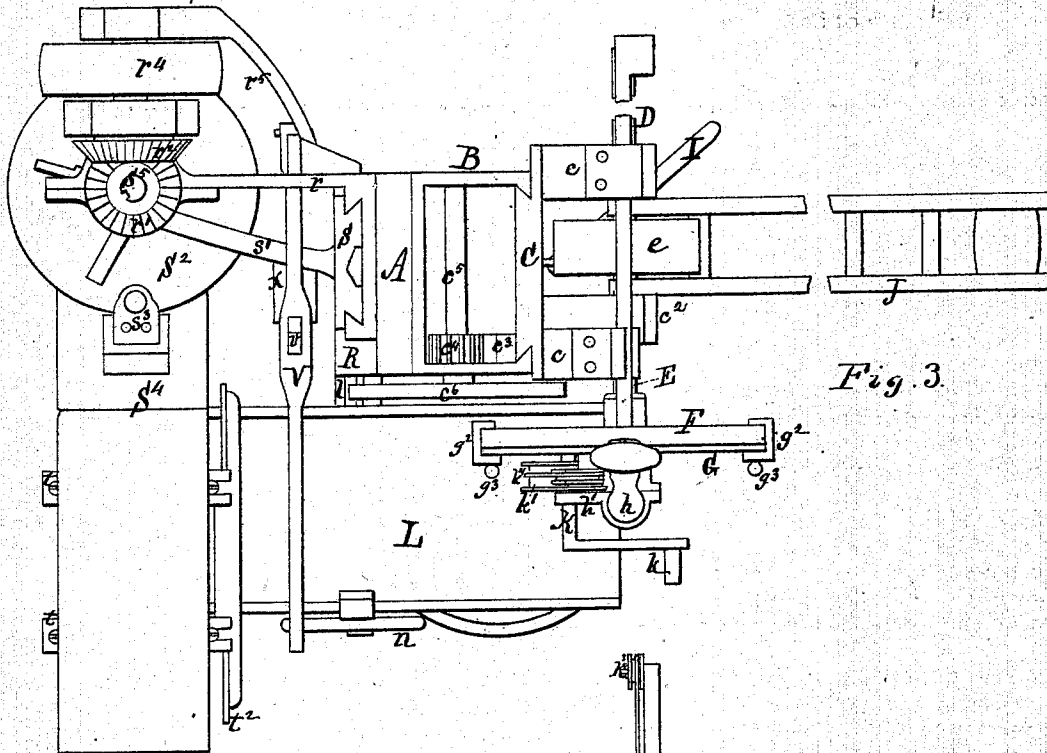


Fig. 3.

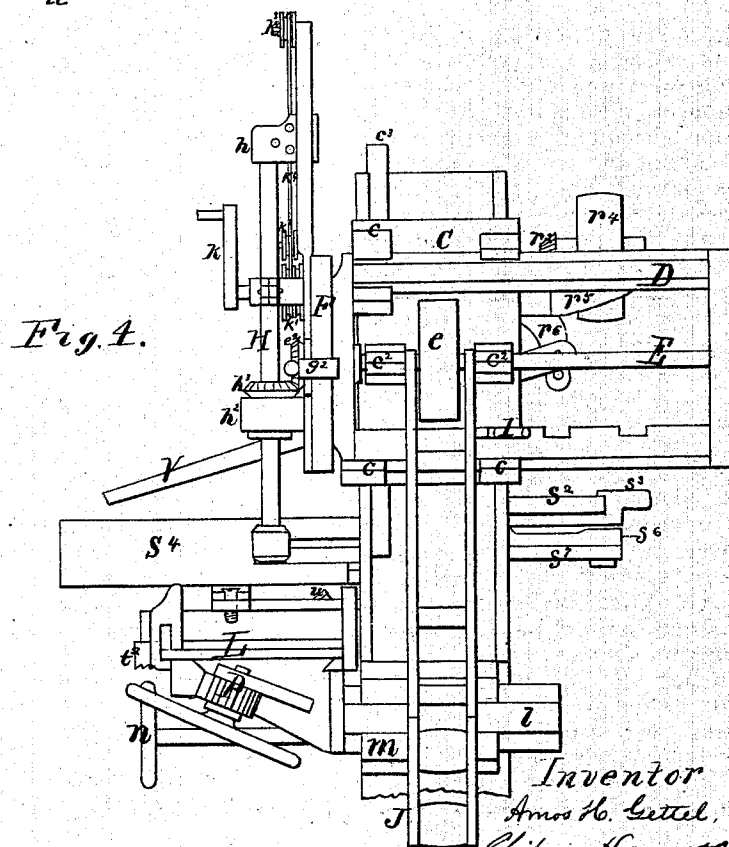


Fig. 4.

Witnesses.
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UNITED STATES PATENT OFFICE.

AMOS H. GETTEL, OF LEBANON, PENNSYLVANIA.

IMPROVEMENT IN BORING AND TENONING MACHINES.

Specification forming part of Letters Patent No. **146,668**, dated January 20, 1874; application filed March 8, 1873.

To all whom it may concern:

Be it known that I, AMOS H. GETTEL, of Lebanon, in the county of Lebanon and State of Pennsylvania, have invented a new and valuable Improvement in Boring and Tenoning Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a side elevation of my improved boring and tenoning machine. Fig. 2 is another side elevation. Fig. 3 is a top view. Fig. 4 is a view of the side opposite to that shown in Fig. 2.

My invention relates to certain improvements in boring and tenoning machines; and it consists in a pair of saws attached to plates capable of lateral adjustment, working in connection with an adjustable cutter or plane bit, for making the tenon; a combination of devices for raising and lowering the frame which carries the tenoning devices.

In the drawing, A represents the stand or platform which supports the machine, consisting of a horizontal base with a vertical standard, to which the working parts are attached. B is a vertical guide-frame, attached to the standard, in which works a plate, C, having four bars, *c*, projecting horizontally from the outer side—two near the upper and two near the lower edge. These bars have horizontal grooves formed transversely near their outer ends, on the lower sides of the upper bars and the upper sides of the lower bars, which grooved bars serve as supports and guides for a rectangular frame, D, which slides therein. About midway between the bars *c* are two similar bars, *c*², in the outer ends of which are bearings for a shaft, E. On the outer end of the frame D is a circular plate, F, attached rigidly to the frame at right angles thereto. Resting against the face of the circular plate F is a cruciform plate, G, the arm *z* of which extends upward a distance about equal to three times the length of one of the other

three arms, and has a slot, *g*, running nearly its entire length, in which slot slides a block, *h*, in which is journaled the upper end of the auger-shaft H, which works in bearings *h*¹ *h*² attached to the plate G. A pulley, *e*, is keyed to the shaft E between the bars *c*², so that the shaft may slide longitudinally with the frame D without changing the location of the pulley. The outer end of the shaft E is journaled in the end of the frame D, passing through the plate F to the outer face of the plate G, where it carries a miter-wheel, *e*², which meshes into a miter-wheel, *h*³, keyed to the auger-shaft H. Suspended from the shaft E, between the bars *c*², is a band-tightener, J, carrying two pulleys at its free end. Pivoted to the plate C is a lever, I, which engages with notches in the lower rail of the frame D, for the purpose of shifting said frame longitudinally. The cruciform-plate G engages with the circular plate F by means of clamps *g*², on the ends of two of its arms, provided with set-screws *g*³. Journaled in an extension of the upper bearing-block *h*¹ of the auger-shaft, and the upper arm of the plate G, is a shaft, K, provided with a handle, *k*, for turning it. On this shaft is a pulley, *k*¹, and just above it is a second pulley, *k*², journaled in the plate G near the lower end of the slot *g*, and near the upper end of the slot *g* is a third pulley, *k*³. A band or cord, *k*⁴, has one end attached to the block *h*, and passes up over the pulley *k*³, down under the pulley *k*², around the pulley *k*¹, and thence to the block *h*, where the other end is secured. On the inner side of the plate C is a rack, *c*³, which engages with a pinion, *c*⁴, on a shaft, *c*⁵, journaled in the sides of the guide-frame B, and having a hand-wheel, *c*⁶, on the outer end. The circular frame F has degrees and fractions thereof marked on its face, and the plate G, turning on its center, can be adjusted to any desired angle by means of the clamps *g*² and set-screws *g*³. The auger-shaft H being attached to the plate G, the auger is made to bore in any direction, corresponding with the angle of inclination of the plate G on its center.

By means of the pinion *c*⁴ engaging with the rack *c*³, the plate C may be raised and

lowered in the guide-frame to correspond with the thickness of the material to be bored, being held at the desired points by any suitable devices.

By means of the band or cord k^4 attached to the block h , and passing around the pulleys k^1 k^2 k^3 , the auger-shaft H is raised and lowered by turning the crank-handle k on the shaft K , feeding the auger to the work and raising it therefrom, as desired, independently of the operation of the rack c^3 and pinion c^4 , connected with the plate C , and without affecting the angular inclination of the auger-shaft.

By means of the lever I engaging with the notches in the lower rail of the frame D , said frame is shifted longitudinally in the grooved bars e , so as to adjust the auger to the desired points in the material to be bored.

The table L , which supports the material to be worked is placed at one side of the standard A , so as to accommodate both the boring and tenoning mechanisms. The table rests upon a platform, L^2 , attached to the outer ends of two bars, l , the inner ends of which slide horizontally in flanged or dovetailed grooves m , on opposite sides of the standard A , so that the table may be moved nearer to or farther from the standard, as may be desired. This movement of the table is accomplished by means of a screw-shaft, N , engaging with a nut, O , seated in a cavity in the standard A , and provided with a hand-wheel, n , for turning it. The longitudinal movement of the table is accomplished by means of a pinion, p , engaging with a rack, q , on the under side of the table, and operated by a hand-wheel on the pinion-shaft, said shaft being journaled in bearings attached to the platform L^2 , so that the table may be shifted back and forward to accommodate the work to both the boring and the tenoning mechanisms. On the side of the standard A opposite to the guide-frame B is a guide-plate, R , from the upper end of which extends a horizontal arm, r , in the outer end of which is journaled vertically a miter-wheel, r^1 , which meshes into a miter-wheel, r^2 , on a shaft, r^3 , carrying a pulley, r^4 , and journaled in the end of a curved bar, r^5 , which also extends from the upper end of the plate R . Sliding vertically in this guide-plate is a smaller plate, S , from which extends an arm, s^1 , to which is attached in a horizontal position a circular plate, S^2 , with degrees and fractions of degrees marked thereon. Under the circular plate S^2 , and connected therewith by screw-clamps s^3 , is a guide-frame, S^4 , which extends outward for a distance somewhat greater than the width of the table L . Keyed to the miter-wheel r^1 so as to revolve therewith, but be capable of sliding vertically therein, is a shaft, S^5 , which passes down through the circular plate S^2 and guide-frame S^4 , and has a radial arm or crank, s^6 , rigidly attached to its lower end,

which arm, s^6 , is connected by a pitman, s^7 , to a reciprocating frame, T , Figs. 1 and 2, arranged to run in guides in the frame S^4 . On the under side of the frame T are two transverse bars, t , to the ends of which two bars, carrying saws t^2 , are attached by means of set-screws working in slots in the bars t , so as to admit of lateral adjustment. Between the saws is arranged an adjustable cutter or plane-bit, u , attached to a block on the under side of the frame T by means of a set-screw, working in a slot in said cutter or bit, by which means it may be adjusted to regulate the depth of cut, or may be removed and replaced by others of different widths.

By means of the set-screws working in the slotted bars t , the saws t^2 may be adjusted as to their distance apart, and to correspond with the width of the cutter u , so as to regulate the width of the notch or tenon cut by the saws and cutter.

Motion is communicated from the pulley r^4 through the gears r^1 r^2 to the shaft S^5 , and by said shaft through the bar s^6 and pitman s^7 to the frame T , carrying the saws and cutter constituting the tenoning devices.

Extending downward from the arm r is a bar, r^6 , to which is pivoted one end of a lever, V , which engages, about midway of its length, with a bar, v , the lower end of which is pivoted between lugs x , projecting from the arm s^1 . The bar v has a number of holes formed in it for the reception of a pin passing through a hole in the lever V , so as to connect it at different points, as desired. The bar passes through a slot in the lever, and the pin passes through both the lever and the bar, and thus connects them together.

By means of the lever V and its connections, arranged as above described, the frame which carries the tenoning devices can be readily raised and lowered to adjust it to the height or thickness of the material to be worked.

As the guide-frame S^4 is connected to the circular plate S^2 by screw-clamps, and moves in an arc of which the shaft S^5 forms the center, it can be readily adjusted at any desired angle.

I claim as new and desire to secure by Letters Patent—

1. The combination of the guide-frame S^4 , connected with the circular plate S^2 by screw-clamps, and carrying the reciprocating frame T , with saws t^2 and cutter u attached, substantially as shown and described.

2. The combination of the saws t^2 and cutter u , adjustable in the frame T , forming the tenoning mechanism, substantially as shown and described.

3. In a boring and tenoning machine, the combination and arrangement of the lever V , pivoted to the bar r^6 of the arm r , and perforated bar v attached to the arm s^1 of the vertically-adjustable plate S for raising and

lowering the tenoning mechanism, as shown and described.

4. In combination with the guide-frame s^4 , carrying a tenoning mechanism, the table L, adjustable longitudinally and laterally, as specified.

5. In combination with the longitudinally-sliding frame D, carrying the boring mechanism, the band-tightener J, suspended from the

shaft E, between the bars c^2 , as shown and described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

AMOS H. GETTEL.

Witnesses:

BASSLER BOYER,
ANTHONY S. ELY.