3 Sheets—Sheet 1.

W. H. DOANE & G. W. BUGBEE.

Universal Wood-Worker.

No. 210,763. Patented Dec. 10, 1878.

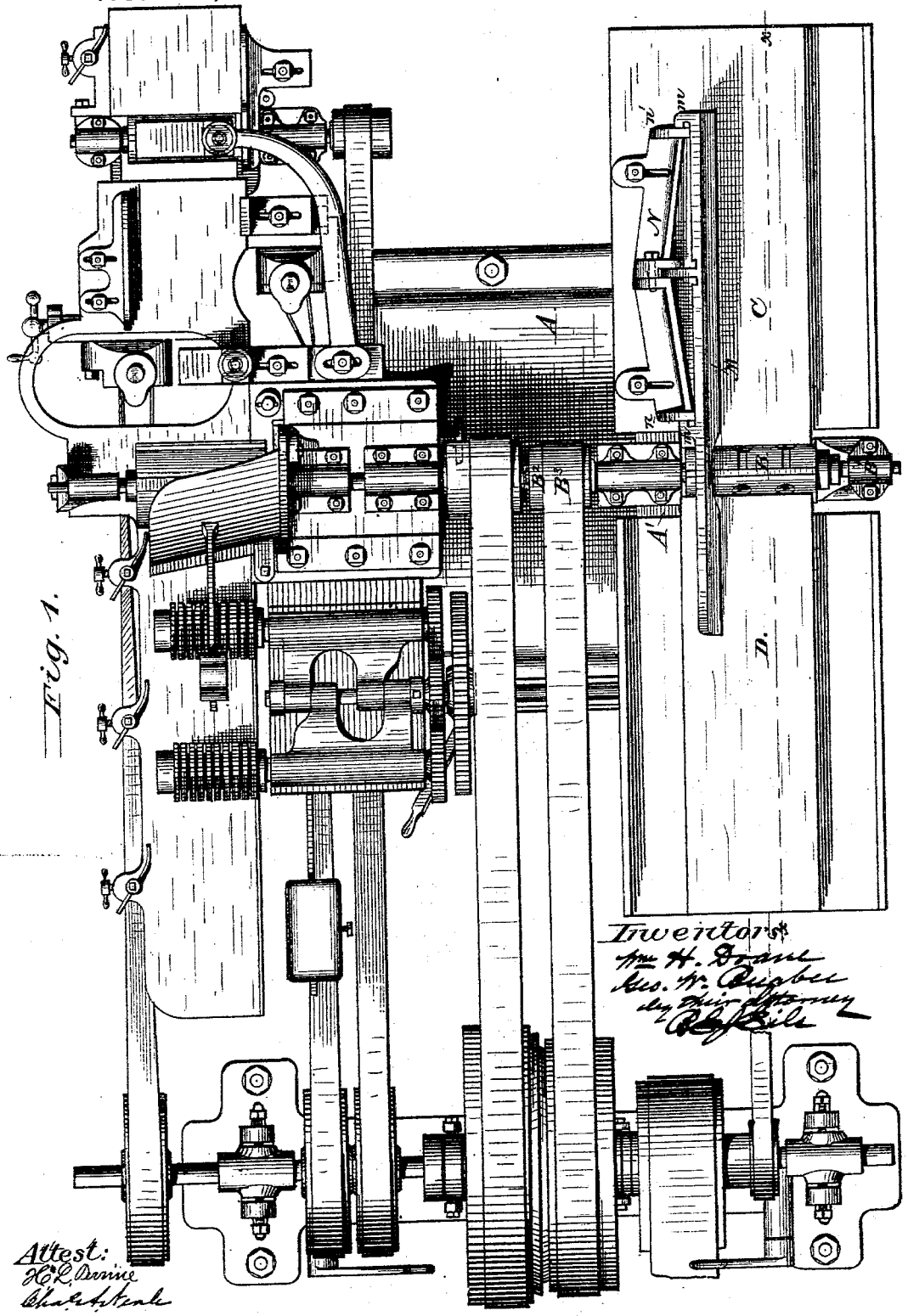

Fig. 1.

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Geo. W. Bugbee
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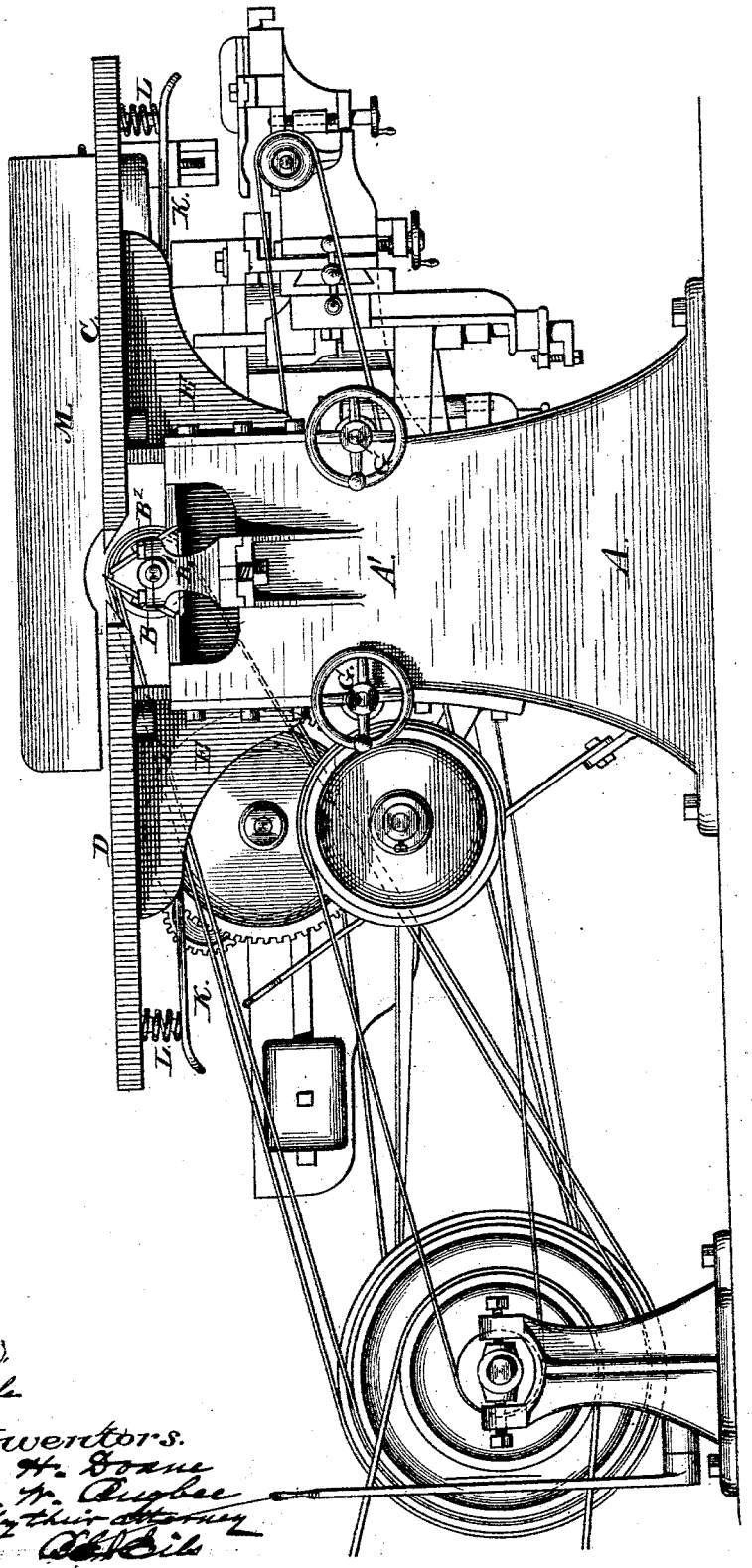
Fig. 2.



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3 Sheets—Sheet 3.

W. H. DOANE & G. W. BUGBEE.
Universal Wood-Worker.

No. 210,763. **Patented Dec. 10, 1878.**

Fig. 3.

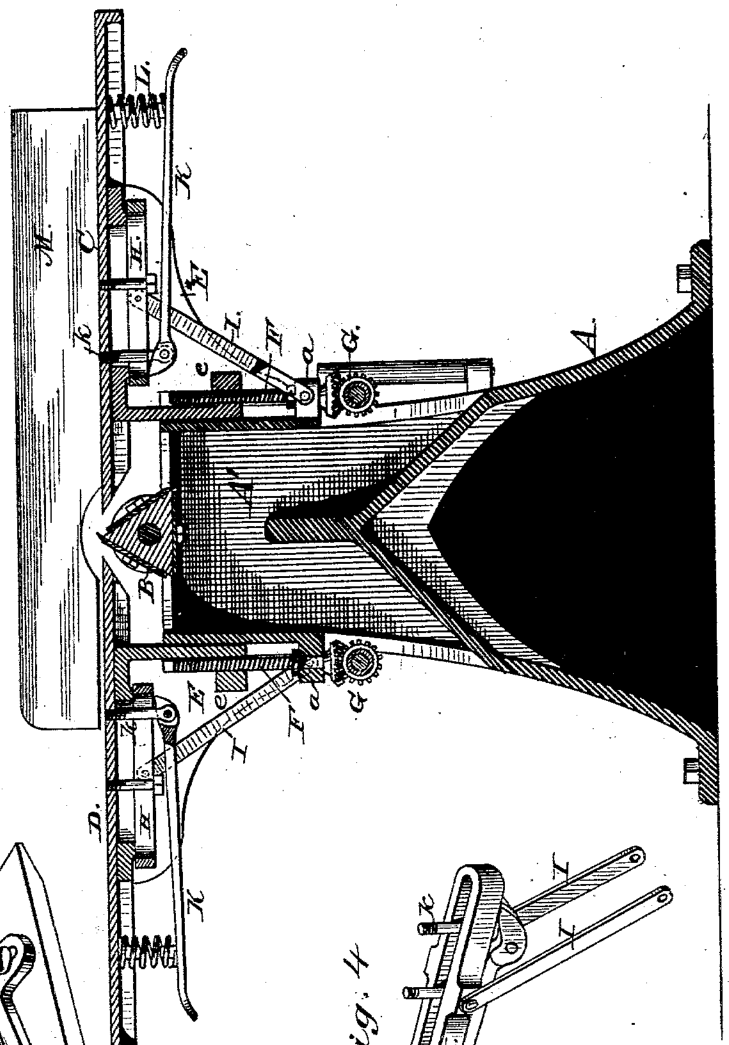


Fig. 5.

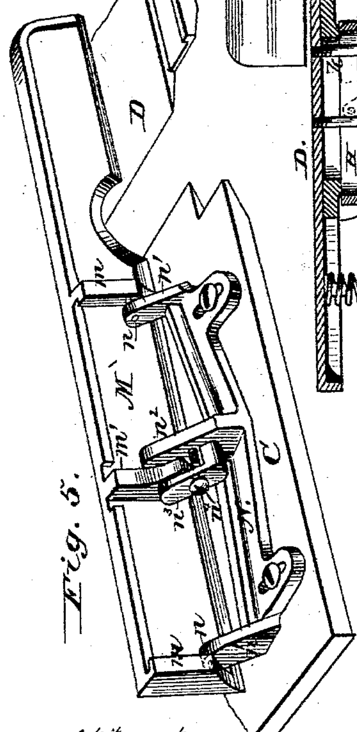
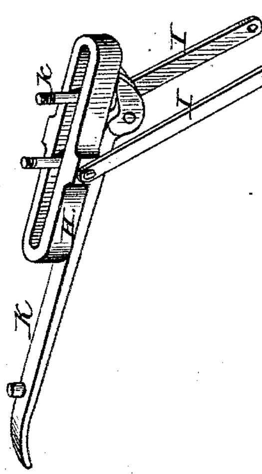


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM H. DOANE AND GEORGE W. BUGBEE, OF CINCINNATI, OHIO, ASSIGNORS TO J. A. FAY & CO., OF SAME PLACE.

IMPROVEMENT IN UNIVERSAL WOOD-WORKERS.

Specification forming part of Letters Patent No. **210,763**, dated December 10, 1878; application filed August 31, 1878.

CASE C.

To all whom it may concern:

Be it known that we, WILLIAM H. DOANE and GEORGE W. BUGBEE, both of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Universal Wood-Workers, of which the following is a full, clear, and exact description.

This invention relates to that class of wood-working machines termed "universal wood-workers," by reason of the fact that a great diversity of work can be done with such a machine. Though its range of work equals the combined capacities of numerous ordinary wood-working machines, each adapted to do a certain kind of work only, still our universal wood-worker actually combines only two machines in its construction. For the sake of clearness we will call one member of the combined machine the "hand wood-worker," and the other member the "molding-machine."

The features of novelty set forth specifically in the claims at the close of this specification relate to the hand wood-worker, and will be clearly understood by the following description of the construction and operation of the same.

In the accompanying drawings, Figure 1 is a plan view of the universal wood-worker, illustrating the entire machine. Fig. 2 is a side elevation thereof, showing more particularly the hand wood-worker side. Fig. 3 is a vertical longitudinal section of the hand wood-worker. Figs. 4 and 5 are detail views hereinafter more specially referred to.

The same letters of reference are used in all the figures in the designation of identical parts.

A denotes the general frame-work of the whole machine, supporting the mechanism of the hand wood-worker as well as that of the molding-machine. The stand A′ on one side of this frame-work carries all the mechanism of the hand wood-worker. The cutter-head B thereof operates between two separate tables, C and D, its spindle being supported in a fixed bearing upon the inner plate of stand A′ and in an endwise-removable bearing, B^1, seated upon a bracket on the outer plate of the stand. Table C is located in advance of the cutter-head, and in use is lowered below the plane of the cut or upper stroke of the knives of the cutter-head a distance equal to the thickness of the shaving to be cut from the stuff. The table D is located in rear of the cutter-head, and the plane which this table should occupy is determined by the kind of work to be done. Both tables are mounted precisely alike, so that a description of the mounting and of the means for operating one will answer for both. Table C is fitted to slide upon a bracket, E, which is mounted between vertical guides on the front plate of the stand A′. A vertical screw-spindle, F, mounted in a fixed bearing, *a*, on stand A′, so that it can turn freely, but not move axially, engages a screw-threaded eye in a lug, *e*, of bracket E. The screw-spindle can be turned to raise or lower the table-supporting bracket by means of bevel-gearing G, operated through a shaft and hand-wheel from the outside of the machine. In order that the table when once arranged with its edge close up to the stroke of the knives of the cutter-head may maintain this relative position, notwithstanding any vertical adjustment by screw-spindle F, we provide the following mechanism: The table is connected to a slide-bar, H, arranged under the horizontal portion of bracket E. This slide-bar is in turn linked to stand A′—in this instance to bearing *a* thereon—by slanting links I. It will be observed now that on raising the table the links in approaching nearer to a vertical position draw the slide-bar and the table toward the cutter-head, and that in lowering the table it and the connected slide-bar are drawn away from the cutter-head. The arrangement of the parts is such that the edge of the table adjacent to the cutter-head will, under the combined action of the screw-spindle and the links on the table, move in curves concentric with the cutter-head. The table is so connected to the slide-bar that it can be moved independently thereof, in order to be accommodated to cutter-heads of different diameters; but when the table has been

once adjusted to a cutter-head it is left to more with the slide-bar only. To this end a lever, K, is pivoted to a stud, *k*, projecting from the under side of the table through longitudinal slots in the bracket and in the slide-bar.

The short arm of the lever is cam-shaped, and made to press the slide-bar up against the under side of the bracket E. The long arm of the lever extends to near the outer end of the table, so that it can be reached conveniently, and is borne down by a spring, L. On raising the long arm of the lever the table is released from the slide-bar, and can be slid in and out independently thereof, while in the normal condition of things the spring and lever will clamp the table forcibly enough to the bracket to prevent it from moving except as the slide-bar is moved under the action of the screw-spindle and links.

The fence M is mounted on the front table, C, and is extended to overhang the rear table, D, a considerable distance. The fence proper is made separate from the bar by which it is secured to table C. This supporting-bar (marked N) can be laterally adjusted on the table. The fence is constructed with grooved ribs *m m* upon the reverse side to engage with studs *n n* on ears n^1 of bar N. The studs *n* are cylindrical, so that the fence can be moved up and down, as well as turn on them to assume oblique positions.

A central lug, *m'*, on the fence is in close contact with a lug, n^2, on the supporting-bar N, and can be clamped between said lug n^2 and a clamp, n^3, by a bolt, n^4, in order to hold the fence rigidly in position when once adjusted. The lower edge of the fence-bar proper is beveled upon the reverse side to a dull knife-edge, so that the fence can at the front have close contact with the table or tables, whether it be adjusted to a vertical or to a slanting position.

It is obvious that the slide-bars H can be operated by single links instead of by pairs of links; also, that the connection between the tables and the slide-bars may be changed without affecting the principle of operation; also, that the automatic endwise motion of the table might be obtained by connecting the link or links directly to the table, in which case the connection should be made adjustable, so as to provide for the independent endwise movement of the table.

The spindle of the cutter-head projects through the inner bearing and carries a pulley, B^2, which is driven by a belt, B^3, from the general counter-shaft of the machine.

We are aware that fences for wood-working machines are known, connected to their supporting-bars by pins and curved slots, admitting of circular and up-and-down adjustments of the fence. We do not, therefore, claim such feature broadly.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination, substantially as specified, of the table, the slide-bar connected therewith, the link for automatically sliding said bar and table, and the screw-spindle for raising and lowering the table.

2. The combination, substantially as specified, of the table, the slide-bar, and the lever pivoted to the table and adapted to operate on the slide-bar.

3. The combination, substantially as specified, of the table, the slide-bar connected therewith, the lever adapted to operate on the slide-bar, the link for automatically moving the latter, and the screw-spindle for raising and lowering the table.

4. The fence and its supporting-bar, directly connected together by cylindrical studs on one engaging elongated straight grooves in the other, which connection provides for adjusting the fence circularly as well as up and down on its supporting-bar.

5. The combination, substantially as specified, of the fence and its supporting-bar, directly connected together by cylindrical studs on one engaging elongated straight grooves in the other, and a clamping device for rigidly securing the fence to its supporting-bar, after proper adjustment thereon.

In testimony whereof we have signed our names to the foregoing specification in the presence of two subscribing witnesses.

WM. H. DOANE.
GEORGE W. BUGBEE.

Witnesses:
ALBERT N. SPENCER,
CHAS. G. JONES.