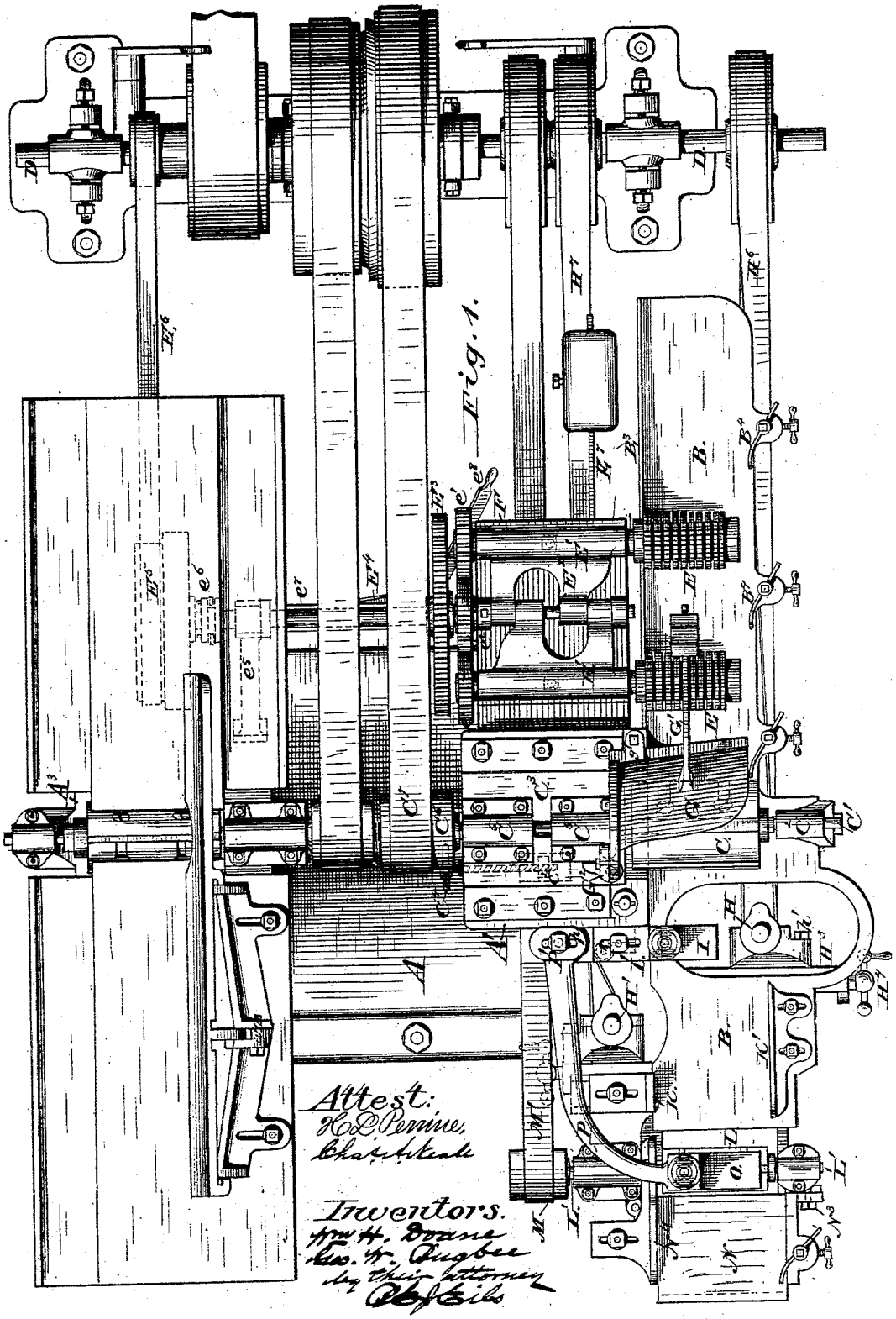
3 Sheets—Sheet 1.

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

Universal Wood-Worker.

No. 210,762. **Patented Dec. 10, 1878.**



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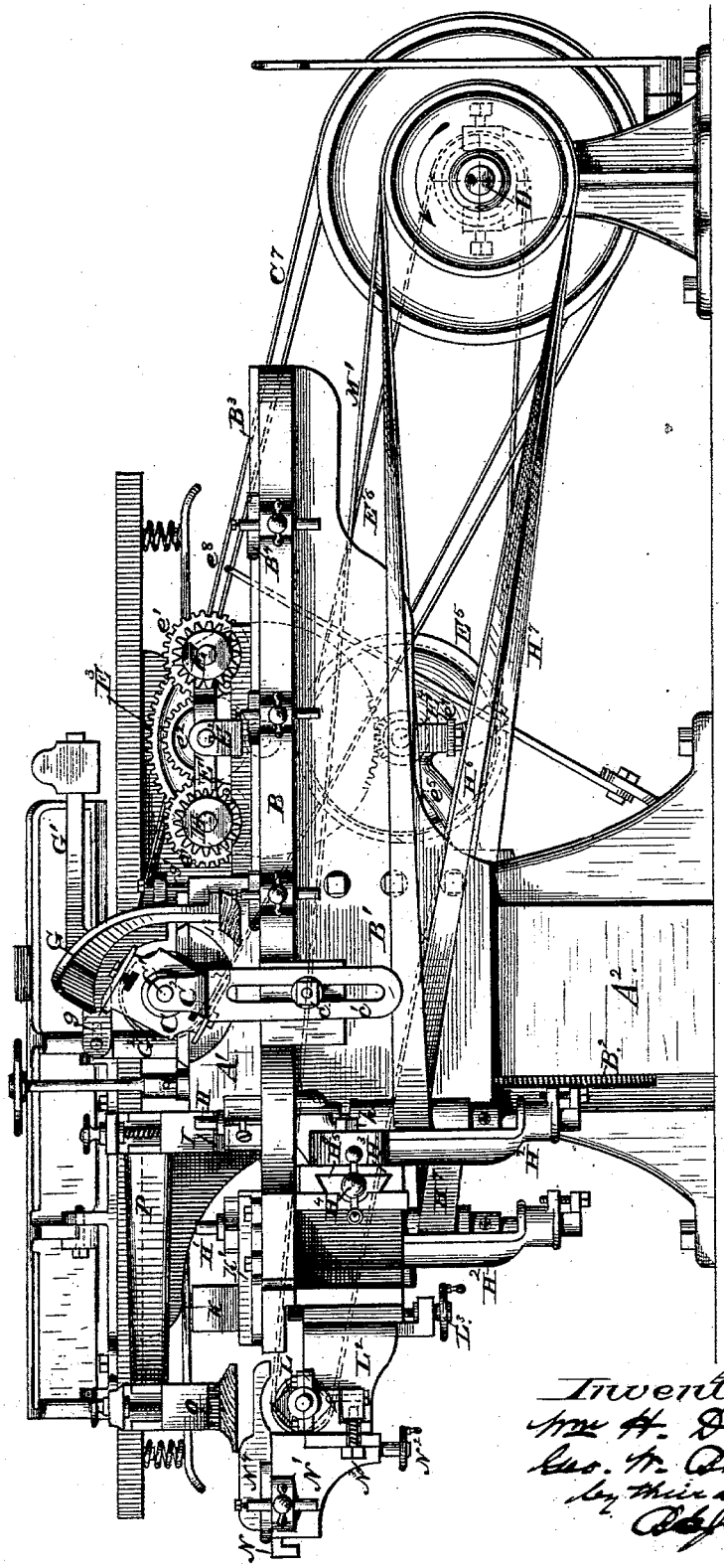

Fig. 2.

Attest
H. C. Dewey.
Chas. A. Seale

Inventors
Wm. H. Doane
Geo. W. Bugbee
by their Attorneys
Dodger & Co

3 Sheets—Sheet 3.

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

Universal Wood-Worker.

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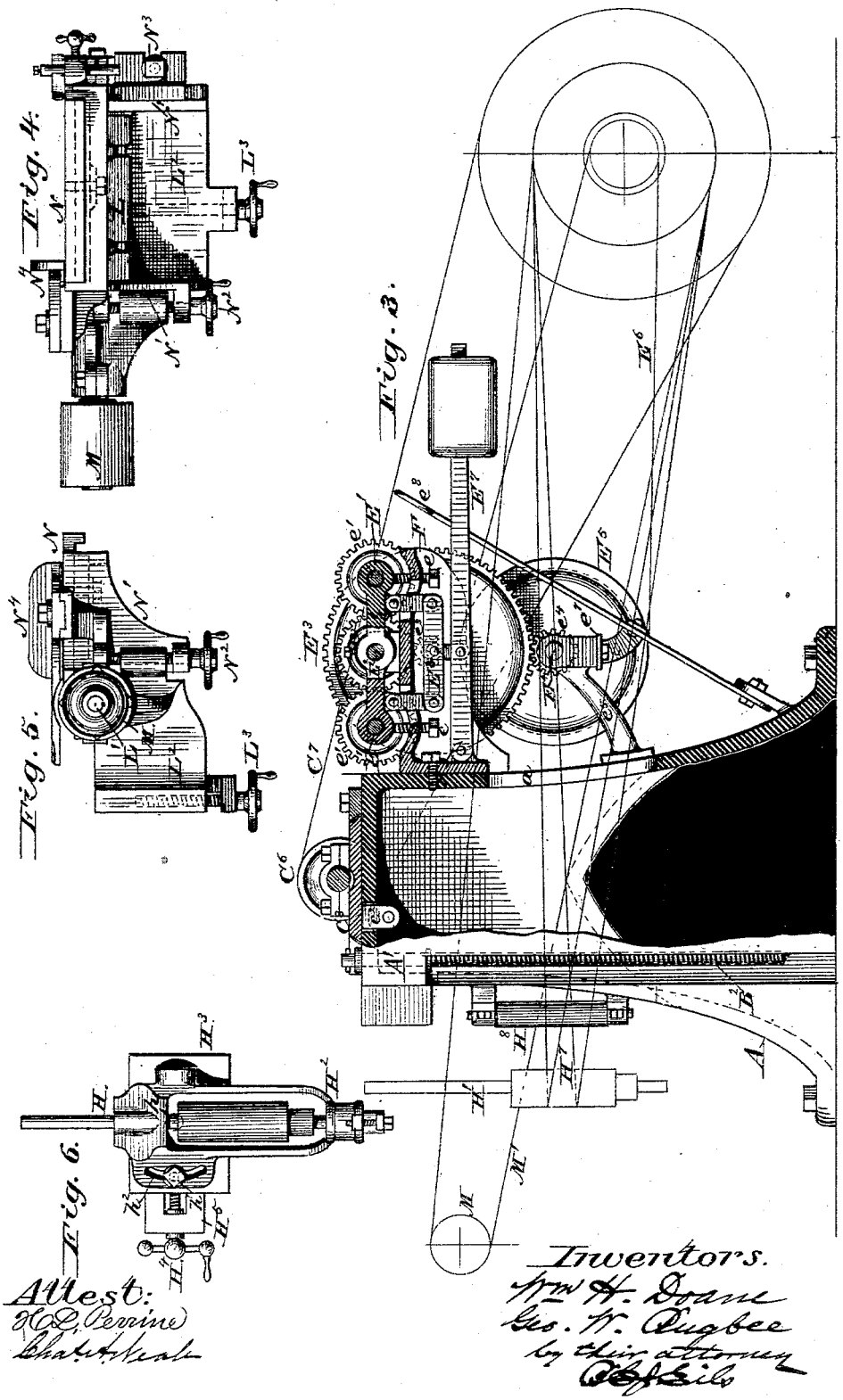

Fig. 4.

Fig. 5.

Fig. 3.

Fig. 6.

Witnesses:
H. C. Perrine
Chas. H. Neale

Inventors.
Wm H. Doane
Geo. W. Bugbee
by their attorney
C. B. Smith

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. **210,762**, dated December 10, 1878; application filed August 31, 1878.

CASE B.

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 perform 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 molding-machine of our universal 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 our universal wood-worker, illustrating the entire machine. Fig. 2 is a side elevation thereof, showing more particularly the molding-machine side. Fig. 3 is a longitudinal sectional elevation of the molding-machine. Figs. 4 to 6 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^1 of this frame-work carries the principal parts of the molding-machine. Upon the front side of this stand is formed a wide dovetailed rail, A^2, to which the downwardly-projecting rear side, B^1, of the table B of the molding-machine is fitted, and on which said table is adjusted vertically by means of a heavy screw-spindle, B^2, which turns in a screw-threaded eye on the side B^1 of the table, and is suspended through the top of the stand A^1, so that it may be conveniently operated from the top of said stand. For convenience of fitting and taking up lost motion, the rear side, B^1, of the table B engages the dovetailed rail A^2 directly on one side only, the other side of the rail being engaged by a separable and adjustable dovetailed bar or gib-piece bolted to said side B^1 of the table. The front side of stand A^1 serves partly as an edge-guide of the stuff fed to the machine; but that portion of table B in advance of stand A^1 is constructed with a permanent fence, B^3, arranged in exact alignment with the face of stand A^1. The stuff in its movement forward is forcibly held against fence B^3 and stand A^1 by a series of strong bar-springs, B^4, adjustably secured in adjustable stocks along the outer edge of the table B, as usual.

The cutting-cylinder C, for operating on the top of the stuff, is keyed to the transverse horizontal arbor C^1, which turns in boxes C^5, on the top of stand A^1, and is also supported at one end in an outside bearing, C^2, adjustably and detachably secured to the front edge of table B by means of a bolt and nut, *c*. The bolt passes through a vertical slot, c^1, in the stem of said bearing, C^2, so that the bolt may move up and down in said slot in adjusting the table. On removing the nut this outside bearing can be slipped off arbor C^1, and thus make room for the endwise removal of the cutting-cylinder C. The boxes of arbor C^1 on top of stand A^1 are connected together by a plate, C^3, with dovetailed edges, fitting under detachable dovetailed bars or gib-pieces bolted to the top of the stand. Plate C^3 has a lug, c^2, on the bottom projecting through a slot in top of stand A^1. A screw-threaded eye in this lug is engaged by a screw-spindle, C^4, (seen best in dotted lines in Fig. 1,) which passes through and is held from moving endwise by the back-plate of stand A^1.

By a collar on the arbor C^1, on one side of bearings C^5, and pulley C^6, on the other side thereof, the arbor is prevented from moving endwise in said bearings; but these bearings, with the arbor and its outer cylinder, can be

moved endwise by means of the screw-spindle C^4 whenever it becomes necessary to so move the cutting-cylinder in using molding-tools.

It will be seen that the screw-spindle will hold the bearings and connections in any desired position, and that the dovetailed gib-pieces holding the bearings down on the stand do away with the necessity of screwing the bearings to the stand, as heretofore practiced, which required an unloosening and again tightening of such screws every time an adjustment of the bearings was made.

A gap is formed in the front side of stand A^1, so that the knives of cuttting-cylinder C may protrude beyond the inner edge of the stuff, and so be enabled to sweep the whole width of it.

The pulley C^6 is keyed to the overhung end of arbor C^1, and is driven by a belt, C^7, from a pulley on the counter-shaft D, which is adapted to drive both the molding-machine and the hand wood-worker separately or conjointly, and will be found described in detail in another application for Letters Patent filed of even date with this application for this patent.

The serrated feed-rolls E E overhang the table B. Their shafts turn, respectively, in sleeve-bearings E^1 E^1, hinged upon an intermediate shaft, E^2, which is supported in fixed bearings upon the bracket-frame F, firmly secured to the side of stand A^1.

The hinged sleeve-bearings of the feed-rolls are arrested in their downward motion and supported upon set-screws *e e*. By sufficiently lowering these set-screws the lower surface of the feed-rolls may be lowered below the plane to which the knives of the cutting-cylinder cut, and so enable the same rolls to feed stuff a second time through the machine, as is necessary oftentimes in working moldings. Heretofore these machines have been so constructed that feed-rolls of larger diameter had to be substituted, in running stuff a second time through the machine, for the rolls used in running the stuff through the first time. The simple provision just described does away with this, and saves much time, trouble, and expense.

The feed-roll shafts are provided with spur-wheels e^1 e^1, meshing into a spur-wheel, e^2, on the intermediate shaft E^2, which is driven by a pinion, e^3, on a short shaft carrying the large spur-wheel E^3. This train of wheels is arranged within such limits that the belt C^7 can run straight from the counter-shaft pulley to pulley C^6 on the cylinder-arbor.

The spur-wheel E^3 meshes into and is driven by a pinion, e^4, on the feed-roll driving-shaft E^4, which extends under belt C^7 across the gap in the frame-work A, between its stand A^1 and its stand A^3, which latter supports the mechanism of the hand wood-worker.

Shaft E^4 is supported in suitable bracket-bearings e^5 e^5, respectively, secured to the sides of the stands A^1 and A^3, and is provided with cone-pulleys E^5, driven by a belt, E^6, from cone-pulleys on the general counter-shaft, as shown in Figs. 1, 2, and 3.

Cone-pulleys E^5 are loose on the shaft, which they drive through means of a clutch, e^6, controlled by a sliding shifter, e^7, which is linked to a lever, e^8, for operating the clutch conveniently from the molder side of the machine without interfering with the various driving-belts.

The feed-rolls are held down to their work with the proper degree of pressure by a weighted lever, E^7, which is pivoted under the bracket-frame F and linked to the center of a bar, E^8, the ends of which are, in turn, linked to the respective hinged sleeve-bearings *e e* of the feed-rolls, all as clearly shown in Fig. 3.

The bonnet G is provided with the usual weighted arm G^1, and serves also the purpose of a presser-bar in front or in advance of the cutting-cylinder C. The bonnet is connected to a standard, G^2, on the plate C^3 of arbor-bearings C^5 on stand A^1, the standard being adapted to turn, so as to swing the bonnet into position in front of the cutting-cylinder C and out of position over the stand to afford free access to the cutting-cylinder.

In order that the bonnet may be adjusted so as to always have its presser-bar G^3 operate as close to the knives of cylinder C as possible, its pivotal point on standard G^2 is made adjustable by providing said standard with a slot, *g*, where the pivot-pin passes through it. A suitable stop-pin, *g'*, limits the descent of the bonnet. In swinging it out of position it is first turned up on its supporting-standard, and then swung around, together with said standard. As the bonnet is carried on the base-plate C^3 of the bearings C^5 it follows that any endwise adjustment of these bearings and cutting-cylinder C equally affects the bonnet, so that the relative positions of the cutter-cylinder and the bonnet with its presser-bar will not be disturbed by such adjustments.

The side cutter-head spindles H and H^1 are supported in hangers H^2, provided with adjustable steps at their lower ends and with bearings at their upper ends. The hangers are alike in construction and arrangement. Each is pivoted at *h* on a slide, H^3, (see Fig. 6,) so that it may be turned to a limited extent to throw its spindle either into a vertical or into a slanting position.

When properly adjusted the hanger is secured in position by a clamping-bolt, h^1, which passes through a slot, h^2, in the hanger to slide H^3. The slides H^3 are interlocked with and move on suitable horizontal guide-rails H^5 on wings or flanges upon the under side of table B. The position of each slide H^3 is controlled by a screw-spindle, H^4, which engages the screw-threaded eye in a lug on the back of the slide. The spindles H and H^1 are provided with suitable pulleys, as shown. The pulley of the outside spindle, H, is driven from a pulley on the general counter-shaft through a belt, H^6, which runs under table B, while the

pulley of the inside spindle, H^1, is driven from another pulley on the general counter-shaft through a belt, H^7, which runs under table F of the feed-roll shafts and bearings, through openings *a*, formed in the sides of stand A and around an idler, H^8.

A vertically-adjustable presser-foot, I, is suspended from a knee, I′, on stand A^1, so as to operate in front of cutting-cylinder C, and in close proximity to the side cutter-heads.

Adjustable guides K and K′ are located upon table B beyond the side cutter-heads to properly guide the stuff to the cutting-cylinder L, which dresses the bottom side of the stuff. This lower cutting-cylinder is located just in advance of the end of table B, its arbor L^1 turning in bearings on a bracket, L^2, fitted to slide up and down on a dovetailed rail on a downwardly-projecting wing or flange of table B. The bracket is controlled by a screw-spindle, L^3, which is swiveled to the bracket and operates in a nut on the flange of table B. This bracket L^2 and all the parts it carries are illustrated in detail by Figs. 5 and 6. The arbor L^1 projects through its inside bearing, and carries pulley M, which is in line with the openings *a* in stand A^1, so that it can be driven by a straight belt, M′, from a pulley on the general counter-shaft, the belt passing under the bracket-frame F of the feed-roll shafts and through stand A^1 by the side of belt H^7.

In order that the stuff on passing beyond cutting-cylinder L may be properly supported, an auxiliary table, N, is provided. This table is mounted on a swinging frame, N^1, and can be adjusted horizontally on said frame, so that it may be arranged close up to the knives of cylinder L. The frame N^1 is hinged to bracket L^2 by a screw-pintle, N^2, and can be swung back, so as to afford free access to the cutting-cylinder L. When in working position this frame N^1 is secured by a bolt, N^3, swiveled to bracket L^2, and engaging a fork on frame N^1. By means of screw-pintle N^2 frame N may be vertically adjusted to a limited extent, so that the plane of table N may be made to coincide with the plane of the cut of the knives of cylinder L, as is required. Table N carries the adjustable fence N^4, an elongation of which overhangs the gap between this table and table B, in order to guide and support the stuff at the point where cylinder L operates on it. A presser-foot, O, presses upon the stuff directly over the cutting-cylinder L. This presser-foot is suspended on an arm, P, which is mounted on the top of stand A^1, and secured thereto by a bolt, P′, passing through a slot, *p*, in the boss on the extremity of the arm into a tap in the stand. On unscrewing the bolt P′ a little the arm P may be adjusted laterally to throw the presser-foot O into proper position, or it may be swung back, so as to throw the presser-foot O back out of position and out of the way.

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

1. The combination and arrangement, substantially as specified, of the general counter-shaft of the machine, the pulley on the arbor of the upper cutting-cylinder, the feed-rolls, the feed-roll driving-shaft, and a train of wheels for transmitting motion from said driving-shaft to the feed-rolls, said train of wheels being arranged outside of the straight path of the belt, which runs from the general counter-shaft to the pulley of the upper cutting-cylinder.

2. The combination, substantially as specified, of the feed-roll, the fixed shaft E^2, the sleeve-bearing of the feed-roll shaft hinged to said shaft E^2, the fixed bracket under the feed-roll, and the set-screw in this bracket for limiting the descent of the sleeve-bearing.

3. The vertically-adjustable main table of the molding-machine, provided with a permanent fence, substantially as and for the purpose specified.

4. The combination, substantially as specified, of the presser-foot over the lower cutting-cylinder and the swinging arm carrying said presser-foot and adapted to be swung laterally entirely clear of the cutting-cylinder and its tables.

5. The combination, substantially as specified, of the laterally-adjustable pivoted bonnet and the swiveled supporting-standard thereof.

6. The combination, substantially as specified, of the endwise-adjustable bearings of the upper cutting-cylinder and the bonnet supported on such bearings.

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.