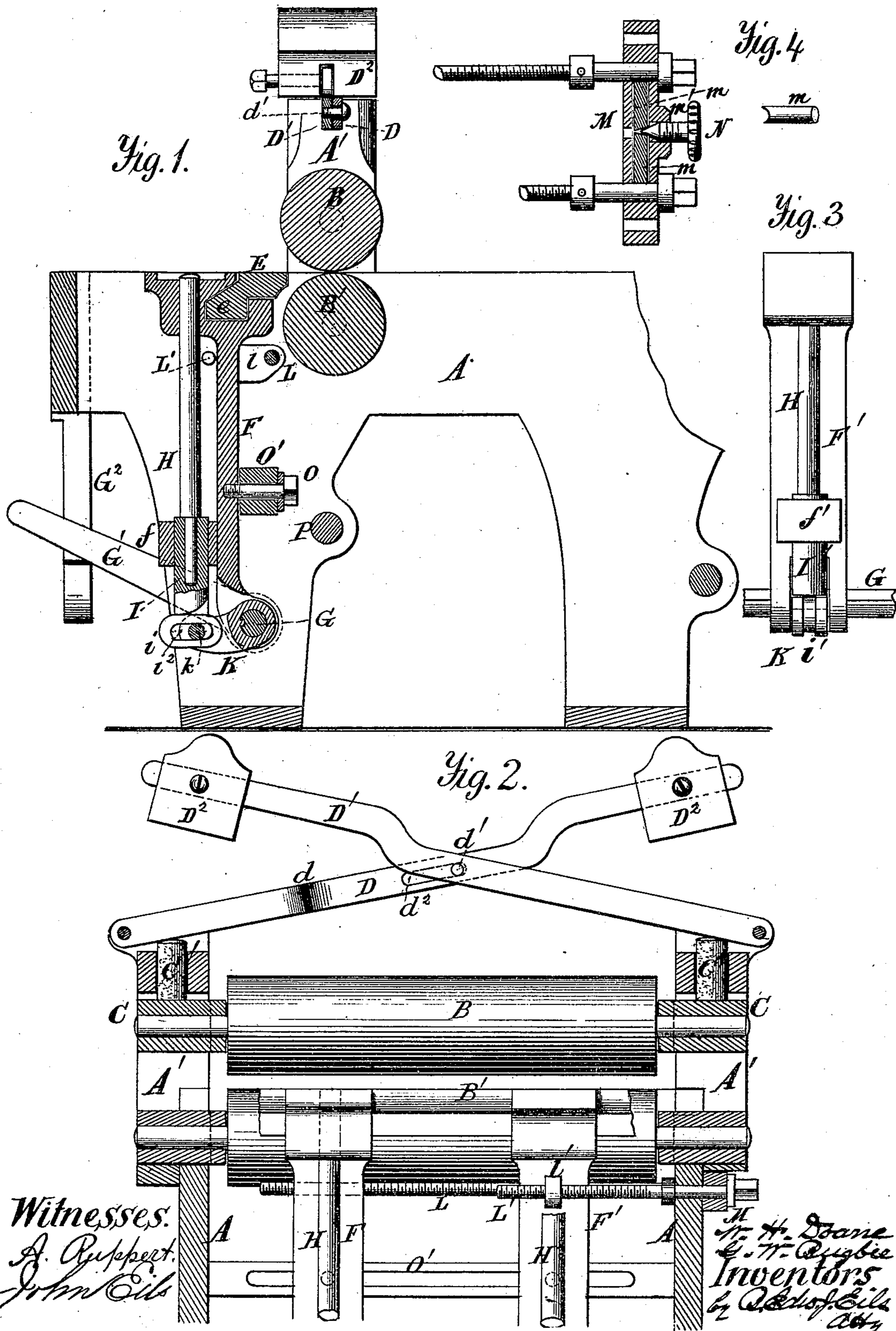


W. H. DOANE & G. W. BUGBEE.
PLANING-MACHINE.

No. 175,676.

Patented April 4, 1876.



Witnesses:
A. Ruppert.
John C. Cils

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2 Sheets—Sheet 2.

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Fig. 5.

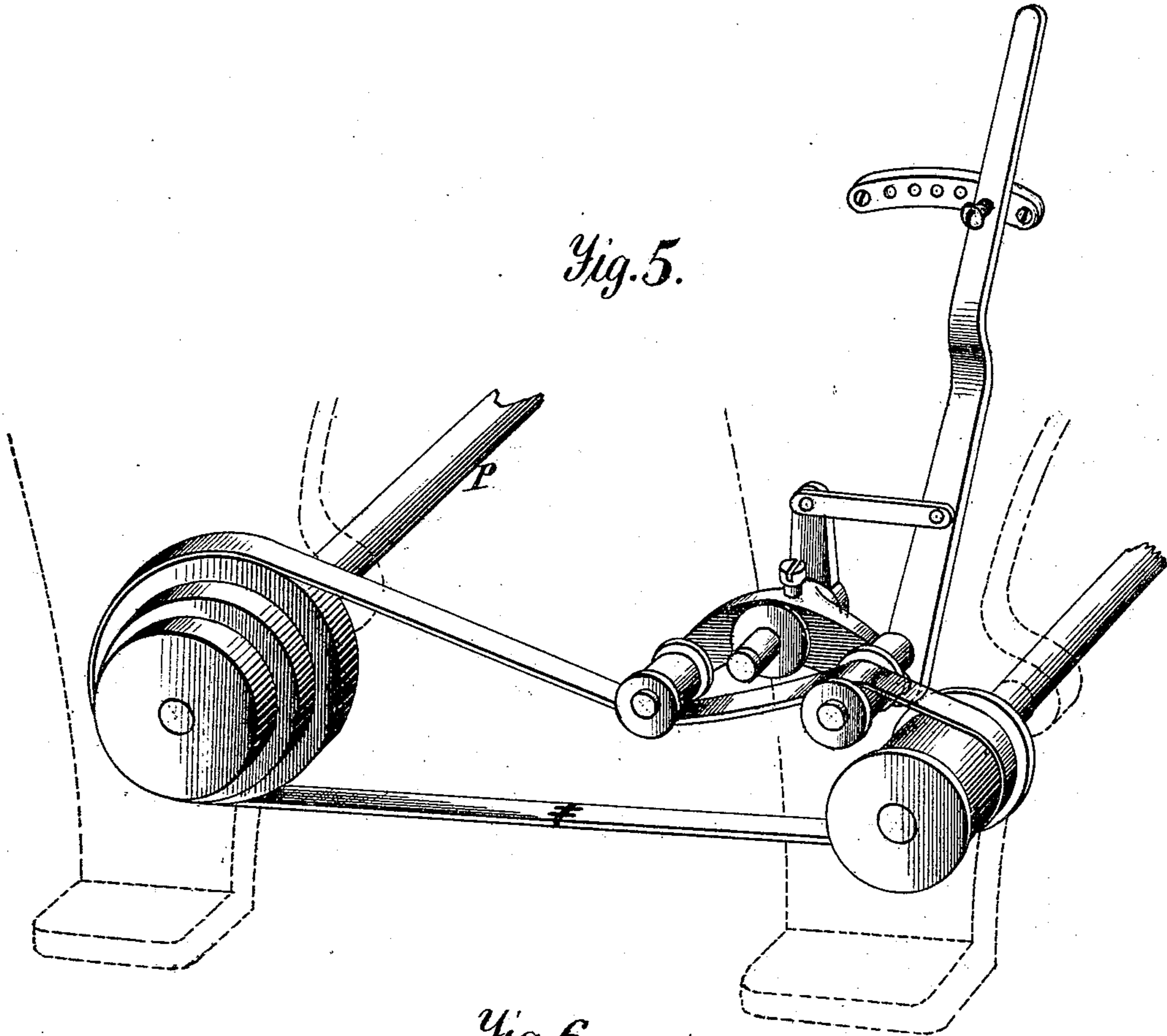
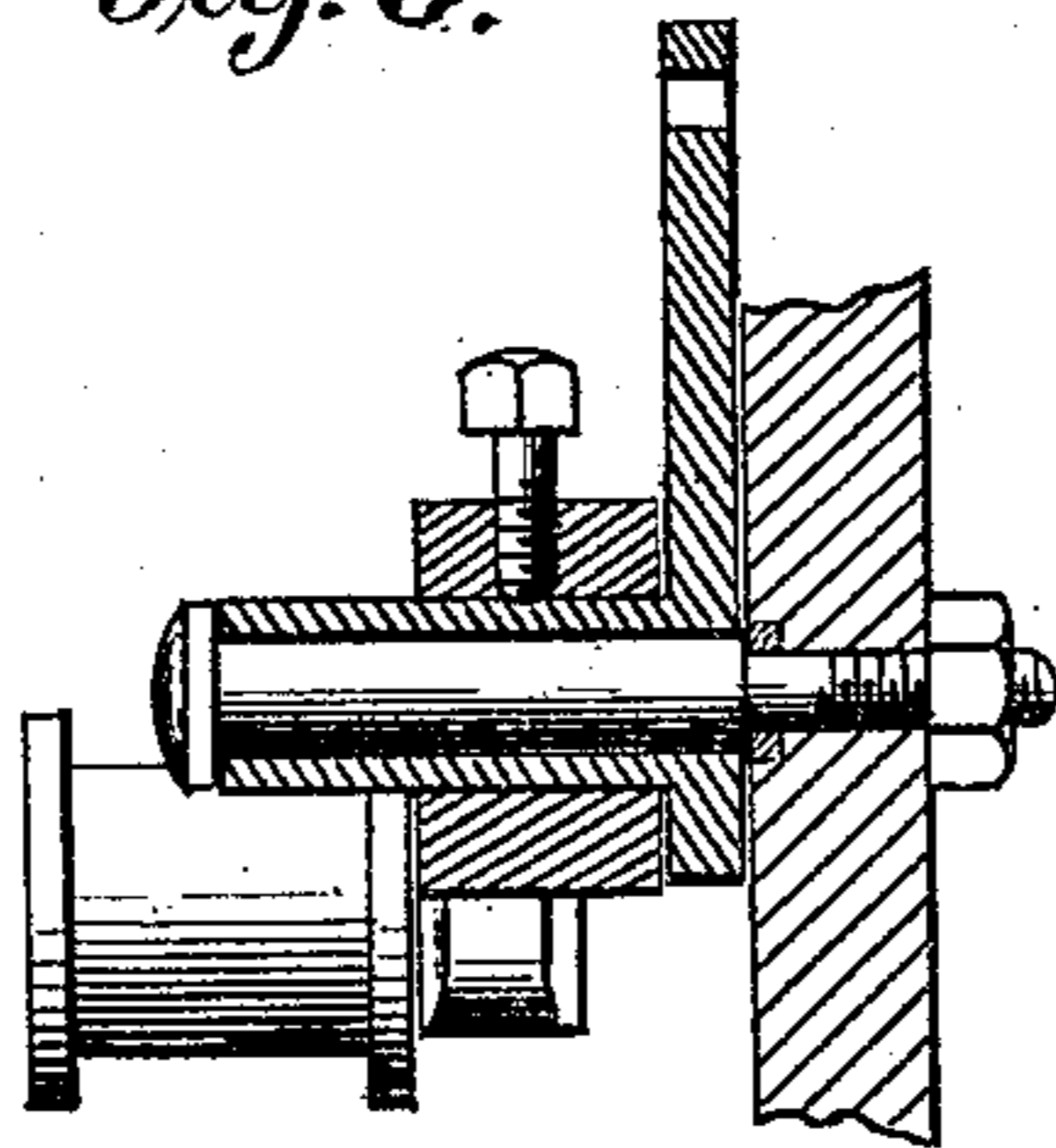


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM H. DOANE AND GEORGE W. BUGBEE, OF CINCINNATI, OHIO.

IMPROVEMENT IN PLANING-MACHINES.

Specification forming part of Letters Patent No. **175,676**, dated April 4, 1876; application filed July 13, 1875.

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 a certain Improvement in Planing-Machines, of which the following is a specification:

This invention relates more particularly to that class of planing and matching machines in which provision is made for a convenient shifting of the matching-arbors, for the purpose of converting the machine into a wide surfacer. However, some of the features of our invention are adapted for more universal application in wood-working machines, as will be readily seen.

Our improvements, briefly enumerated, consist, first, of a novel method of weighting the feed or pressure rolls by means of weighted levers arranged side by side, directly above and in planes parallel to the axes of the rolls, to which they are about equal in length. They thus occupy a space where they will be entirely out of the way, and can be centrally connected so as to equalize their actions on the opposite ends of the rolls. The levers reach over the top of the housing, so that they may find a rest thereon when the yielding roll sinks below a certain line. Secondly, in means for simultaneously raising and lowering the matching-arbors, which is accomplished by a vertical movement of the bearings in which they are stepped at the lower ends, imparted by crank-arms on a rock-shaft, which are engaged with said bearings, and are arranged to partake of their lateral adjustments. Thirdly, in locking the screw-spindles used for laterally adjusting the matching or side-cutting arbors by one or more wedges caused to operate on both spindles by tightening a screw. We hereby avoid the annoyance of having the adjusting-screws turned, and the adjustment of the matching-arbors disturbed, by the unavoidable vibrations of the machine, when in operation.

In the annexed drawings, Figure 1 is a vertical longitudinal section of our improved machine, illustrating only so much thereof as is necessary to an understanding of our invention. Fig. 2 is a transverse section of the

same. Figs. 3, 4, 5, and 6 are detail views, hereinafter more specifically referred to.

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

The journals of the feed rolls B and B' turn in bearings arranged in slots in the standards A' A', formed on, or attached to, the main frame A of the machine. Each bearing C of the upper movable feed-roll B carries a spring-cushion or buffer, C', projecting through an aperture in the upper cross-bar of its respective standard. The levers D and D' act through these buffers upon the bearings C of the upper feed-roll B, each lever carrying an adjustable weight, D², by means of which the pressure of the roll on the stuff can be regulated. The levers are pivoted between jaws, in which the standards terminate some little distance beyond the buffers, as clearly seen in Fig. 2, and reach thence in opposite directions, and side by side, toward and over the top of the opposite standards, in planes parallel to the axis of the roll. The weighted levers, reaching from the respective housings to which they are pivoted over the top of the opposite housing, have this peculiar advantage, namely, that the levers or their weights may find a rest on the top of said housings when the lift on the roll is released to such an extent that the free ends of the levers or their weights descend to the level of the top of the housings, whereby the further vibration of the levers is obviated. Just beyond their midlength the levers are bent upward to clear the tops of the standards, and the one marked D has also a slight lateral deflection at d to permit the other one to pass it, while both act centrally on their respective buffers. Midway between their fulcra these levers are connected by a pin, d¹, fixed to one and playing in a slot, d², in the other one, whereby their movements up and down are steadied, and they are made capable of standing hard r usage than if they were not thus connected. This union of the levers has also the effect of equalizing their actions on the opposite ends of the rolls.

The plate E in front of the rolls B and B' forms part of the permanent bed-plate of the machine, and is constructed with a rail, e, hav-

ing the cross-sectional configuration clearly seen in Fig. 1. The brackets F and F', on which the matching-arbors are arranged, are at their upper ends fitted on this rail e, and are at their lower ends supported on a shaft, G. The arbors H and H' turn near their upper ends in bearings forming part of the brackets, but at their lower ends they are supported in steps I and I', which are fitted to slide up and down in lugs f and f' on the brackets. Each step has a horizontally-slotted lug, i and i', entering between the jaws of a crank-arm, K, the wrist-pin k of which engages the slot i² in such lug. The two crank-arms—there being one for each step—are respectively connected to the shaft G by keys fitted in a longitudinal groove in the shaft, so that they may slide but cannot turn on the shaft. In the example shown these crank-arms are mounted on the shaft between the jaws in which the brackets F and F' terminate at their lower ends, and will thus necessarily partake at both ends of the lateral movements of the brackets and matching-arbors, so that all strain will be avoided. The shaft G is at one end provided with a hand-lever, G¹, by which it can be turned to raise or lower the arbors H and H' by sliding the steps I and I'. Previous to lowering the matching-arbors to the position shown in the drawings, the cutter-heads must be removed therefrom. The lever G¹ is supported by the hook G².

The brackets F and F' are independently adjustable laterally, one by the screw-spindle L engaging a nut, l, thereon, and the other by the screw-spindle L', which operates on the nut l' thereon. The screw-spindles turn at the end, where they are operated in a bearing-plate, M, which contains two wedging-pins, m, of the form clearly shown in Fig. 4, bearing with their concaved ends against the respective screw-spindles. Their other ends, filed slightly oblique, are acted on by the pointed end of a thumb-screw, N, fitted to turn in a thread in the hub m' of the bearing-plate. After the brackets and matching-arbors have been properly adjusted by the screw-spindles, the point of the thumb-screw N is forced in between the wedges m, which are thus caused to bind firmly on the screw-spindles, preventing them from turning by reason of the vibrations of the machine. As a substitute for the wedges, a bent steel bar might be used, which, on being straightened under the action of a screw, would brace with its ends against the screw-spindles. Clamping-screws O, tapped in the brackets, and passing through a slotted bar, O', of the framework, are also provided as a further means of securing the brackets when adjusted.

The lower feed-roll is driven from the shaft P, the pulley of which is connected by a slack-belt with the driving-pulley in the usual way. A belt tightener, preferably constructed as clearly shown in Figs. 5 and 6, is used to

tighten the belt when the feed rolls are to be brought into play.

The method of weighting the rolls is equally applicable to surfacing-machines and to pressure-rolls as well as feed-rolls.

We are aware of Patent No. 70,592, showing a machine in which the matching-arbors are supported at their lower ends in steps attached to or forming part of racks engaging pinion on a shaft, by turning which the matching-arbors may be raised or lowered. The use of these racks and pinions is subject to one serious objection in this connection: In all cog-gearing, the spaces between the cogs are wider than the thickness of the cogs; hence there is always a little play in such gearing, and such play would allow the matching-arbors to jump slightly while in operation. No such objection exists in the slotted crank-arms employed by us. They will hold the cutter-spindle firmly. Moreover, the mechanism which we have shown for raising or lowering the matching-arbors is more simple in construction, less costly, and more reliable in every respect. We are also aware that the weighted levers of pressure or feed rolls have been so connected, as shown, for instance, in United States Patent 142,460, that the effect of the weights will always be evenly distributed to both ends of the movable roll. Hence our invention touching this feature is limited to the peculiar arrangement and connection of the parts which we have shown and described.

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

1. The combination, substantially as set forth, of the yielding roll, the housings, and the weighted levers arranged side by side over the roll and parallel to its axis.
2. The adjustable feed-roll, in combination with the weighted levers D and D¹ suspended over it side by side, in planes parallel to its axis, and connected together by a pin, d¹, fixed on one, and playing in a slot, d², in the other, substantially as specified.
3. The combination of the rock-shaft G, crank-arms K K, vertically-sliding steps I I', and matching-arbors H H', substantially as specified.
4. The combination of the screw-spindles L and L', wedge or wedges m, and thumb-screw N, substantially as specified.
5. The combination of the rail e and shaft G, with the brackets F F', arbors H H', sliding steps I I', and crank-arms K K, all arranged to operate as specified.

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:

DANL. L. LYON,
IRVING SPENCER.