(No Model.) 2 Sheets—Sheet 1.

L. O. ORTON & L. H. BERRY.

PLANING MACHINE.

No. 264,959. Patented Sept. 26, 1882.

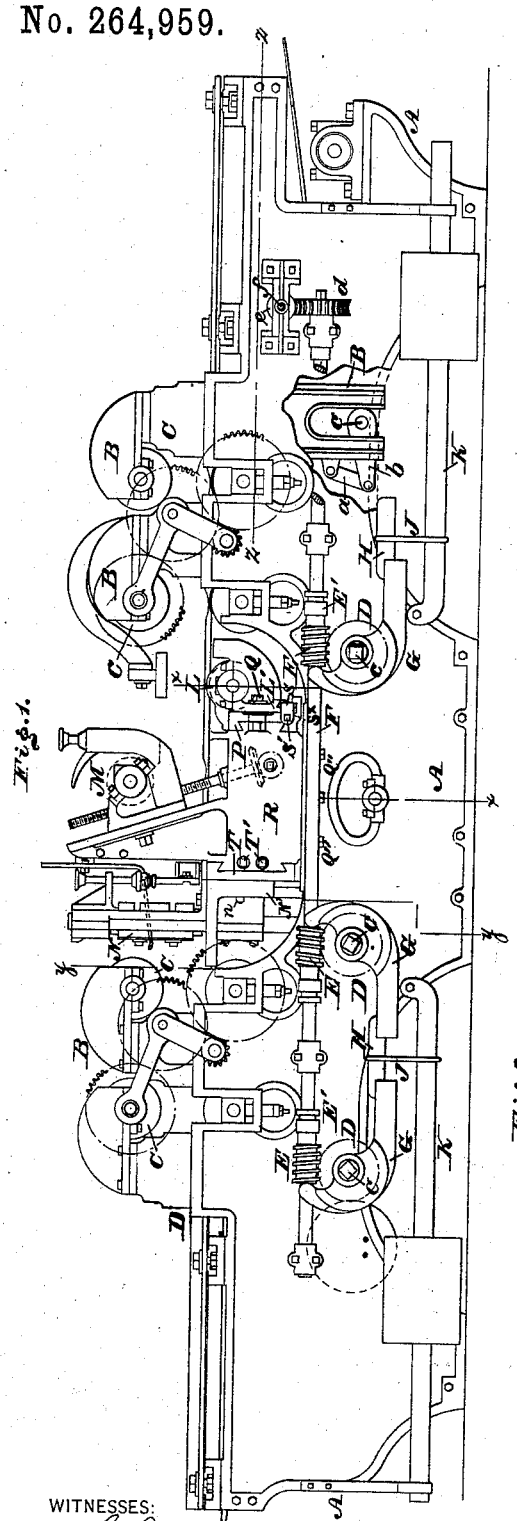

Fig. 1.

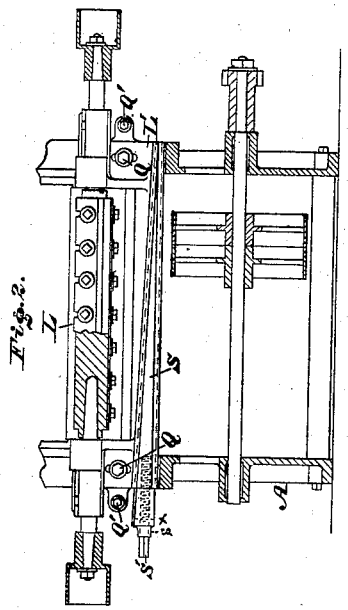

Fig. 2.

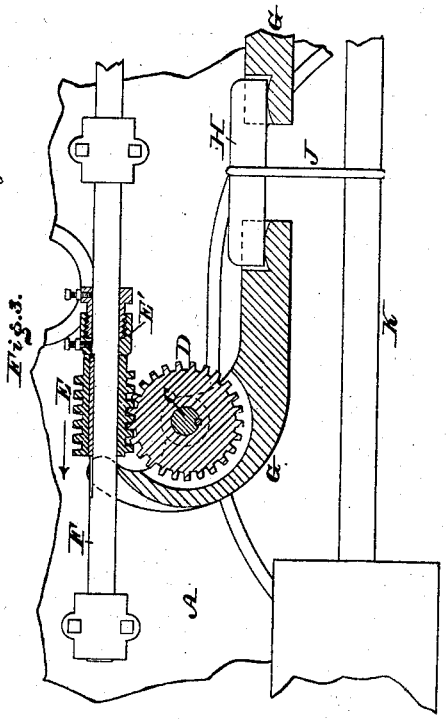

Fig. 3.

WITNESSES:
L. Douville
W. F. Kircher

INVENTORS:
Lyman O. Orton
Lucien H. Berry,
BY John A. Wiedersheim
ATTORNEY.

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Fig. 4.

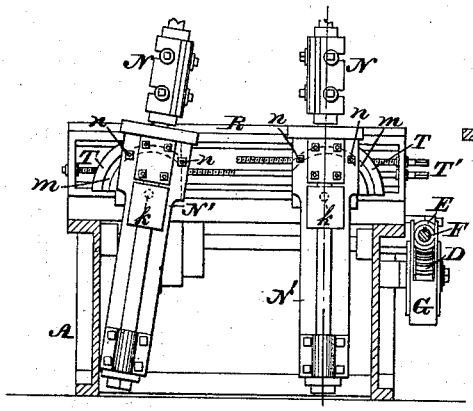


Fig. 6.

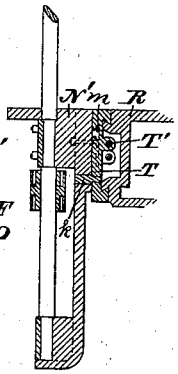
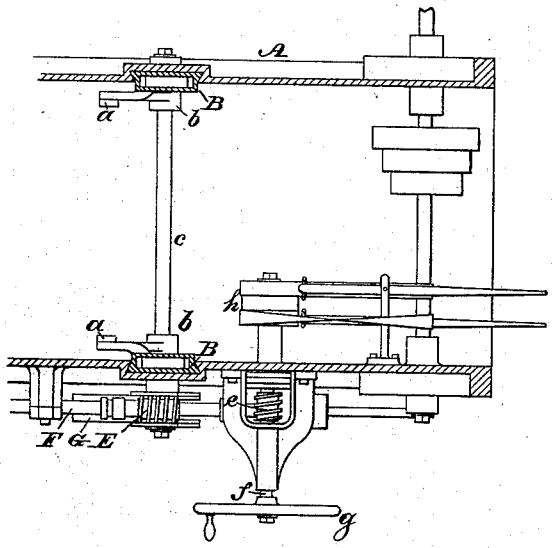


Fig. 5.



WITNESSES:
L. Douville
W. F. Kircher

INVENTORS:
Lyman O. Orton,
Lucien H. Berry,
BY John A. Biedenstein
ATTORNEY.

UNITED STATES PATENT OFFICE.

LYMAN O. ORTON AND LUCIEN H. BERRY, OF PHILADELPHIA, PA.

PLANING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 264,959, dated September 26, 1882.

Application filed September 9, 1881. (No model.)

To all whom it may concern:

Be it known that we, LYMAN O. ORTON and LUCIEN H. BERRY, both citizens of the United States, residing in the city and county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Wood-Planing Machines, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a side elevation of the planing-machine embodying our invention. Fig. 2 is a transverse vertical section thereof in line *x x*, Fig. 1. Fig. 3 is a longitudinal vertical section of a portion thereof enlarged. Fig. 4 is a transverse vertical section in line *y y*, Fig. 1. Fig. 5 is a horizontal section in line *z z*, Fig. 1. Fig. 6 is a vertical section in line *x x*, Fig. 4, the cutter-head being removed.

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

Our invention relates to improvements in machines for planing timber and boards; and it consists in grouping the cutting-cylinders in such manner that timber may be planed absolutely square.

It also consists in placing the cutting-cylinders for planing the lower side of the timber or board in front of the other cutting-cylinders, for the purpose of producing a finished side from which to work, or by which to gage the other sides.

It also consists of means for removing the lower cylinder and its frame or saddle for purposes of sharpening and adjusting the cutters.

It also consists of a novel method of vertically adjusting the lower cutting-cylinder.

It also consists of means for raising and lowering the top feeding-rollers by hand or power.

It also consists of a method of weighting the upper feeding-rollers.

It also consists of means for removing the side cutting-cylinders from the path of the board or adjusting the same for planing bevel or taper surfaces, as will be hereinafter set forth.

Referring to the drawings, A represents the frame of the machine, to the sides of which are fitted vertically-moving bearings B, which carry the upper feeding-rollers, C C. (Shown raised in Fig. 1.)

To each bearing B is pivoted a link, *a*, which is pivoted to a crank-arm, *b*, fixed to the shaft *c* of a worm-wheel, D, said shaft being mounted on the frame A.

Each wheel D engages with a worm, E, which is connected to a rotary shaft, F, which extends in the longitudinal direction of the machine, and has its bearings on the sides of the frame A, it being noticed that the several worms for the worm-wheels are located on said shaft F.

Suspended from each shaft *c* is an arm, G, which is of curved or angular form, its upper end being adapted to be engaged by the worm E on the shaft F, and the lower end bearing against a bridge, H, from which depends a link, J, which is connected to the weighted lever K, the latter being pivoted to the frame A.

It will be seen that the arms G are in pairs, those of a pair facing each other and the bridge H straddling them, whereby one weighted lever K renders service for each arm G.

It will also be seen that the worms and worm-wheels employed in connection with the pair of arms are pitched in reverse order, as more readily seen in Fig. 1.

To one end of the shaft F is connected a worm-wheel, *d*, with which meshes a worm, *e*, on a shaft, *f*, which latter extends transversely, is mounted on the frame A, and carries a crank-handle or crank-wheel, *g*, and loose and fixed pulleys *h*, whereby provision is made for operating the shaft F by hand or power.

The worms E are each fitted to the shaft F by a spline or feather-key, whereby, while they rotate with said shaft, they also have sliding motions thereon.

Located on the shaft adjacent to each worm is a stop, E′, consisting of two sleeves fitted to each other telescopically, and secured to the shaft by means of screws which permit adjustment of the stop relatively to the requirements of the worm.

It will now be seen that when the board or timber is advanced to the feed-rollers, and is engaged thereby, it raises said rollers, which are mounted on the vertically moving or sliding bearings B, as has been stated. The elevation of the bearings B raises the links *a* and crank-arm *b* and rotates the shaft *c*, and consequently the worm-wheels D. These wheels

thus act as pinions and bear against the worms E as a rack, and impart sliding motions to said worms on the shaft F, so that they press against the upper ends of the arms G and lift the bridge H, whereby the weighted levers K are elevated. In this manner the weights of said levers are exerted on the sliding frames or bearings B and the feed-rollers are held down firmly to their work. After the board or timber is run through the feed-rollers and bearings lower, and the parts assume their normal positions.

When it is desired to raise the upper feed-rollers by power the belts of the pulleys *h*, which belts are operated from suitable parts of the machine, (see Fig. 5,) are properly shifted, so that the shaft *f* is rotated; or said shaft may be operated by the handle or wheel *g* in order to raise the feed-rollers by hand. The worm-gearing *e d* operates the shaft F, whereby the worm-wheels D are rotated. The shafts *c* of said wheels D turn the crank-arms *b*, which lift the links *a*, and thereby elevate the frames or bearings B. As the upper feed-rollers are mounted on said bearings it is evident that they are properly raised. When the timber is inserted between the rollers the rotation of the shaft F is discontinued, and the upper rollers lower on the timber. This causes the descent of the frames or bearings B, the rotation of the worm-wheels, the sliding movement of the worms, the operation of the arms G, and the consequent action of the weighted levers on the upper feed-rollers, as has been before stated.

L represents the lower cutting-cylinder; M, the upper cutting-cylinder, both of which are mounted horizontally and transversely on the frame A, and N N two side cutters, which are mounted vertically on the frame A, the several cylinders having power applied to their mandrels or shafts in any suitable manner.

It will be seen that the several cylinders are grouped for the purpose of planing timbers square or on four sides, and made to effect such planing absolutely square. Said cylinders are placed opposite to each other as exactly as possible. Furthermore, the cutting-cylinder L, for planing the lower sides of the timber or board, is in front of the other three cylinders, thus producing a finished side for the timber or board, which side, moving as the bed of the machine, gages the other sides, thus producing true work.

The bearings or frame L′ of the cylinder L are connected to a transversely-sliding piece, P, said frame having vertical slots, through which are passed bolts Q, which screw into the piece P, which is bolted to a frame, R, the latter also supporting the other cutting-cylinders, M N, the slide P being dovetailed to said frame R, and said frame R being bolted to the frame A. When the bolts Q are loosened the cutting-cylinder L may be raised or lowered, or adjusted relatively to the amount of work to be performed, after which the bolts are tightened and the parts retain their adjusted positions. In order to conveniently raise and lower the frame L′ of said cutter-cylinder L, the under side of said frame is inclined, and to said side is fitted a wedge, S, whose outer angular end, S^{x}, carries a threaded journaled bolt, S′, to engage with a threaded opening in the frame P. By rotating the bolt there is imparted to the frame L′ a vertical movement which is slow and accurate and parallel or uniform on both sides.

It will be seen that the wedge S is tongued, and the frame L′ is grooved, in the present case of dovetailed form, whereby the wedge may be inserted from the side of the machine, and lateral displacement of the wedge is prevented. The wedge, furthermore, extends entirely across the frame L′, the contiguous faces of the wedge and frame being a single incline, thus employing but a single wedge-shaped bar for the adjustment of the lower cutting-cylinder.

The slide P and frame R are connected by bolts Q′. When the latter are unscrewed or withdrawn the slide P may be displaced from the frame R, and the lower cutting-cylinder, L, thereby entirely removed for purposes of sharpening, adjusting, and repairing said cutters. By withdrawing the bolts Q″ of the frame R all of the cutter-cylinders may be removed for similar purposes.

The side cutting-cylinders, N, may be adjusted laterally or set at an angle for planing taper or bevel faces, as follows: Each bearing or frame of the mandrel or shaft of the cutting-cylinders is pivoted, as at *k*, to a slide, T, which, having a segmental slot, *m*, is dovetailed to the frame R to admit of transverse or lateral adjustment by the operation of the screws T′, which are rotated in the bearing-frame N′.

When either of the cutters N is to be set at an incline, or to have its angle of inclination changed, the set-screws *n*, which operate in segmental slots *m*, are slacked. The frame of said cutter is then turned on its pivots *k* in either direction, as desired, and when the position sought for is attained the screws *n* are tightened. Both cutters may be adjusted in this way into inclined positions. When it is desired to adjust either of the cutters toward or from the other without inclining it or changing its angle of inclination the screws *n* are not disturbed, but the bearing-frame and connected parts of each cutter-frame, including slide T, are moved as one by its screw T′.

By means of the adjustment of inclination above referred to the cutters are adapted to plane bevel-faces of greater or less angle. Either method of adjustment allows them to be moved away from the path of the timber, so as not to obstruct the same. Furthermore, the pivots *k* and bolts or screws *n* provide means for connecting the frame of each cutter N with the respective slide T at different points, thus securely attaching said frame and slide, and preventing motion or shifting of the former from its adjusted position.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The upper, lower, and side cutting-cylinders, in combination with the frame R, vertically-adjustable frame L′, the dovetailed piece P, bolts Q′, and bolts Q″, substantially as and for the purpose set forth.

2. In a wood-planing machine, a vertical side cutting-cylinder and its bearing-frame, in combination with the slide T, having a segmental slot, *m*, the bolts or screws *n*, and the pivot *k*, and the frame R on which said slide moves, said bearing-frame being connected with the said slide at different points by said screws *n* and pivot *k*, substantially as and for the purpose set forth.

3. The lower cutting-cylinder, L, and vertically-adjustable frame L′, having its lower side inclined, in combination with the single wedge-shaped bar S, having an angular end, $S^{\times}$, the screw-bolt S′, and frame P, said bolt being journaled to said angular end of the bar and engaging with said frame P, and the bar and frame being tongued and grooved, substantially as and for the purpose set forth.

4. In a wood-planing machine, shaft *f*, provided with crank-wheel *g*, shaft F, a sliding worm, E, arm G, a weight depending from said arm, a shaft, *c*, movable bearings for the upper feed-rolls, and devices intervening between shaft *c* and said bearings for lifting the latter, substantially as set forth.

5. Vertically-movable bearings B, link *a*, crank *b*, shaft *c*, a gear-wheel, D, shaft F, a sliding worm, E, a rocking arm, G, mounted on shaft *c*, and a weight supported partly or wholly by said rocking arm, substantially as set forth.

6. Weighted lever K, in combination with link J, bridge H, arms G, on which said bridge rests, shafts *c*, on which said arms are mounted, sliding worm E, shaft F, and connecting devices between the latter shaft and the upper feed-rolls, substantially as set forth.

7 The adjustable stop E′, consisting of two telescoped sections, in combination with shaft F, on which it is mounted, sliding worm E, splined on said shaft, an arm held by a weight in engagement with said sleeve, and connecting devices between the shaft F and the upper feed-roll, substantially as set forth.

L. O. ORTON.
L. H. BERRY.

Witnesses:
H. E. GARSED,
W. F. KIRCHER.