F. Douglas.

Planing Mach.

No. 95782. Patented Oct. 12. 1869.

Fig. 1.

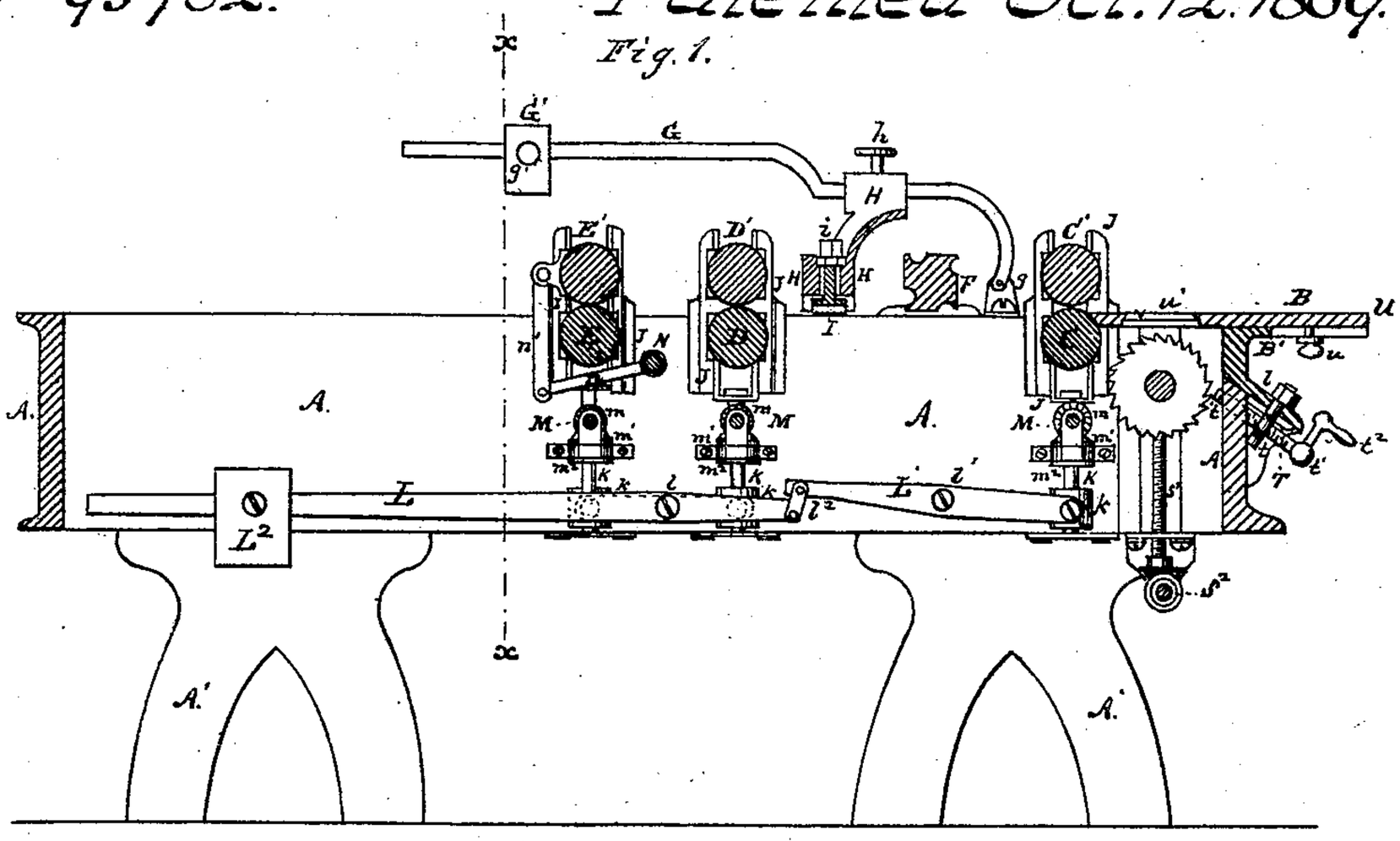


Fig. 2.

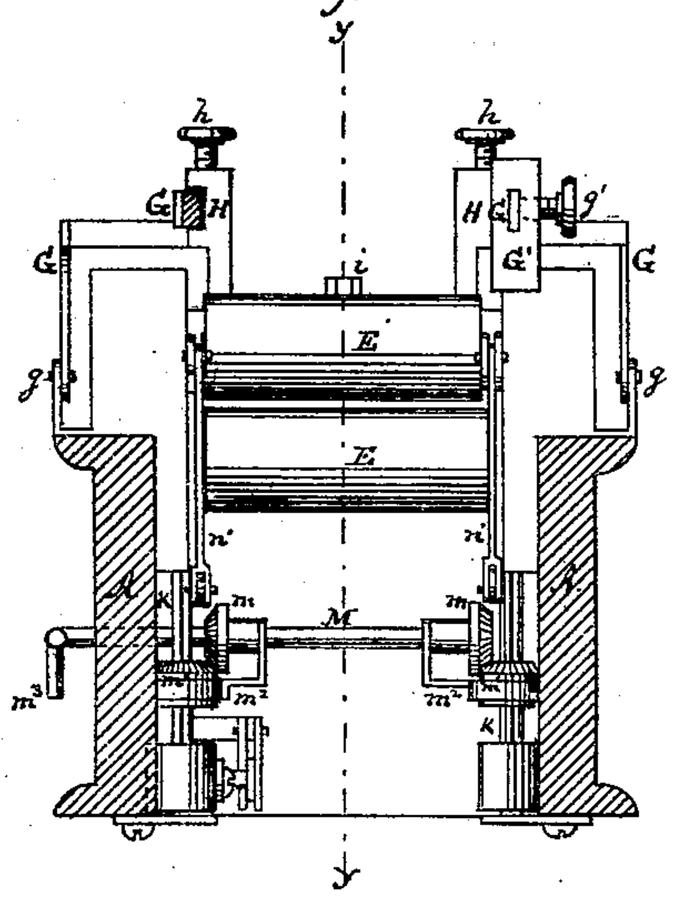


Fig. 3.

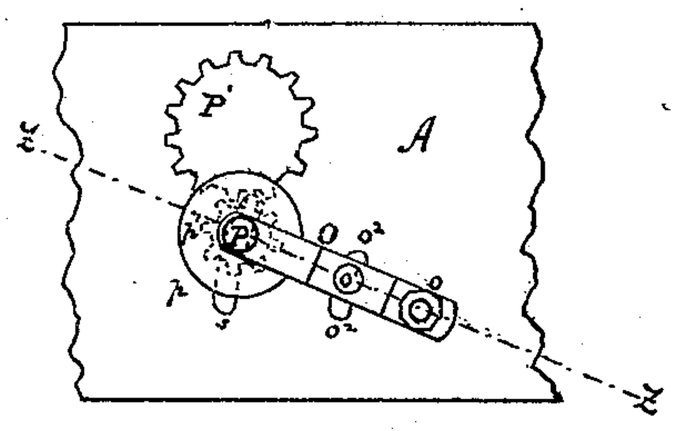


Fig. 4.

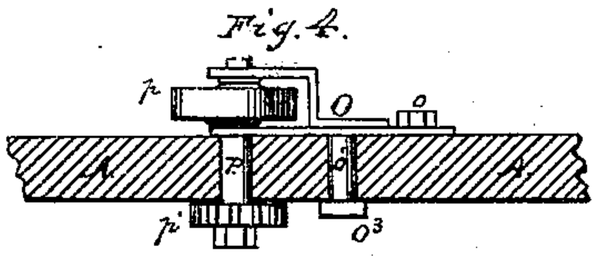
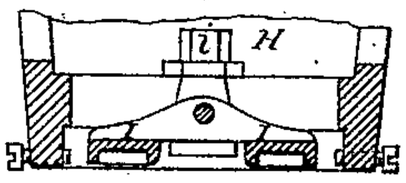


Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

FRANK DOUGLAS, OF NORWICH TOWN, CONNECTICUT.

IMPROVEMENT IN PLANING-MACHINE.

Specification forming part of Letters Patent No. **95,782,** dated October 12, 1869.

To all whom it may concern:

Be it known that I, FRANK DOUGLAS, of Norwich Town, in the county of New London and State of Connecticut, have invented a new and Improved Machine for Planing and Molding; 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 accompanying drawings, making a part of this specification, in which—

Figure 1 is a longitudinal vertical section. Fig. 2 is a section through line *x x* of Fig. 1. Fig. 3 is a side view, showing the operation of the adjustable gear. Fig. 4 is a section through line *z z* of Fig. 3. Fig. 5 is a detached view of the part I.

The object of this invention is to provide for public use a machine for planing and molding in which the several parts are more perfectly and readily adjustable than heretofore, so that it can be operated with increased convenience, while at the same time it is adapted to a greater variety of work.

In the drawings, A indicates the frame, and A′ the legs, of the machine. B indicates the feed-table; C C′, the first feed-rollers; D D′, the second set of feed-rollers; E E′, the third set; F, the cutter; G G, two levers hinged to frame A at *g*, and provided with weights G′, adjustable by means of set-screws *g′;* H, a frame, supported by the two levers G G, along which it is adjustable by means of set-screws *h h*, and itself supporting a presser-bar, I, pivoted at the center, so as to press upon the plank or planks toward its ends on either side of the pivot, whereby it can yield at either end to the inequalities of the planks without taking off the pressure, and at the same time can be set as near as desired to the cutter, and can be made to press upon the wood with any degree of force that may be judged proper. The several feed-rollers are also perfectly adjustable.

The journal-joxes of each upper roller are supported in a frame, J, which rests upon a vertical spindle, K.

The spindle box or step *k* is in its turn supported by a compound lever, L L^1, the two parts of the lever being pivoted respectively at *l* l^1 and connected by a link or joint at l^2. The compound lever is provided, as seen at L^2, with an adjustable weight.

By raising or lowering the handle of the lever all the spindles K K K and the frames J J and upper rollers, C′ D′ E′, can be independently raised or depressed to accommodate them to the work.

The pivot *l* passes through the bar that connects the receiving-rolls E′ D′ at or near its center, thus bringing the pressure of the weight L^2 equally upon said rolls.

The end of the lever L is connected with one extremity of a lever, L^1, by a connecting-bar, l^2. The lever L^1 is pivoted to the side of the frame, and its opposite extremity is connected with one or more rolls, C′, thereby bringing the same pressure to bear upon the roll C′ that is brought on the receiving-rolls without the use of any heavier weight at L^2 than would be required without the additional lever and rolls, or, in other words, utilizing the power that is wasted in all other machines by connecting with the end of the lever L another lever, L^1, and set of rolls C′ D′ instead of a weight.

Each upper roller can be set at any distance from its mate (the under roller) by rotating a small cross-shaft, M.

The ends of the cross-shaft support a miter-wheel, *m*, which gears with and rotates a cylinder, M′, through which the spindle K extends.

The cylinder is held by a collar, m^2, so that while it can revolve it cannot slide up or down, and therefore is always in gear with the wheel *m*. The spindle is connected to the cylinder by a feather and groove, so that the rotation of the cylinder will carry the spindle round also, while at the same time the latter is free to slide up and down through the former.

The lower end of each spindle screws into the block or nut *k*, which is connected to the lever, and is not capable of rotating.

When, therefore, the shaft M is caused to revolve by means of a crank or key, m^3, the spindles which support one of the upper rollers are screwed up or down in their socket or step *k*, and the upper roller is thereby adjusted higher or lower with relation to the lower roller, as may be desired.

In order that the upper roller may always

remain parallel to the lower one, I connect its journal-boxes, at each end, to a cross-shaft, N, by means of a rigid arm, *n*, and a connecting-rod, *n'*, extending from the extremity of the arm *n* to the journal-box, or to a lug or rigid arm attached thereto.

Whenever one end of the upper roller is raised it rocks the shaft N, and the latter, by means of the arm *n* and rod *n'* at the other side of the machine, raises the other end of the roller the same distance, and preserves the parallelism of the two rollers. This device may be attached to each pair of rollers.

The speed of the feed-gear and rollers may be regulated without changing the speed of the line-shaft or other motive apparatus by means of an adjustable gear. (Represented in Figs. 3 and 4.) In said figures, O represents a frame swinging upon a pivot, *o*, at one end, and at its opposite end carrying a shaft, P, which works in a grooved slot, *s*, in the main frame A, one end of the shaft projecting on the inner side and the other on the outer side of the main frame.

The frame A or shaft P may extend across the machine and pivot on both sides, with pulley on outside of one side and pinion outside of the other. The frame A may be pivoted at o^1 and checked at *o*, and produce the same effect.

The inner end of the shaft P carries belt-pulleys *p*, from which the feed-gears are driven. The opposite or outer end of said shaft carries a small pinion, *p'*, that gears with a wheel, P', (shown in red, Fig. 3,) which may be geared with a succession of gears to all the feed-rolls.

The shaft P being adjustable in position in the slot *s*, gears *p'*, of different sizes, may be attached to it, and thereby the speed of the feed-rolls may be varied at pleasure without changing the speed of the line-shaft. A set of these gears *p'* will be connected with every machine.

When a particular speed is desired, a certain pinion can be selected and fixed upon shaft P, and used till the speed ought to be changed again, when it can be removed and another fixed in its place. The pinions can be marked so as to show at a glance the speed they will give with any given speed of the line-shaft. A nut, screwing onto the end of shaft P, may be used to fix the pinions in place. The pinion is slipped in its place, and then the nut screwed on outside of the pinion, so as to clamp the latter between the collar and nut, the shaft being grooved and the pinions provided with a feather to prevent them from slipping.

The frame O can be clamped in any position, to accomodate it to the different sizes of pinions, by means of an arm or pin, o^1, extending through a curved slot, o^2, in the frame, and having, on the outer side of the frame, a screw-nut, o^3, the operation of which will be readily understood from the drawings.

The saw-mandrel is supported in vertically-sliding boxes, which screw up and down by means of vertical screw-rods s^1 s^1, the rods at each end of the mandrel being simultaneously operated by a horizontal shaft, s^2, connected with them by bevel-gear wheels. By this means the saws can be vertically adjusted at pleasure.

One, two, or more saws may be employed upon the mandrel, and they may be adjustable in position thereon, to accommodate them to the various kinds of work for which they will be needed. To this end a screw-thread is formed upon the mandrel R, and by means of screw-nuts on each side of the saw the latter may be clamped in any required position.

Blocks *r' r''*, slipping upon the mandrel, may be employed between the side of the saw and the inner face of the nuts if it be not desired to extend the screw-threads of the mandrel but a short distance from the ends of the same; and by adjusting the blocks or washers properly on one or the other side of the saw the latter may be fixed at any point on the mandrel. Between the two threaded ends of the mandrel the latter may be made square or polyhedral, so that the blocks or the saws cannot slip during its revolution.

Cutters for the purpose of smoothing or molding the under side of the plank may be employed at any convenient point or points in the machine, preferably between the saws and the vertical line of the cutter F, as shown in Fig. 1. The saws may at any time be removed from the mandrel, and a set of cutting or molding tools or cutter-heads may be employed in lieu thereof.

In connection with the parts above described, I employ an adjustable feed-table, B, constructed as follows: The end of the frame A is provided with a bed or truck, T, inclined thirty degrees, as shown in Fig. 1. The frame of the feed-table B' is provided with an inclined base, *b*, fitting upon the truck or bed T, as shown in the drawings. An arm, *t*, rigidly attached to the part *b*, extends down through a vertical slot in the part T, and through a hole in it screws a rod, t^1, provided with a handle, t^2. By rotating the rod t^1 the incline *b* can be slid up or down on the inclined truck which supports it, and thus the plane of the table can be set at any desired elevation with relation to the saws, cutters, or feed-rollers.

The part B' serves simply as a support for the plane of the table. The latter consists of a board or platform, U, working in a dovetail bed in the upper face of the part B', and capable of sliding horizontally in toward or out from the rollers C C', and of being fixed firmly in any position by means of a set-screw, *u*. At *u'* a large opening is made in the platform U, sufficient in extent to allow the saws to be adjusted in any position on the mandrels while projecting up through said opening. The opening is then closed with a slide, *v*, which slides laterally across the part U, and is provided with a single narrow slot just sufficient to accommodate the saw. As the saw is moved along toward one end or the other of the man-

drel, the part *v* can be slid toward one or the other side of the table to accommodate it while closing up the opening *w'*, and rendering the feed-table convenient to work upon. One or more slides, *v*, may be employed, according to the number of saws.

The presser-bar I above described can be adjusted along the frame H toward either side of the machine, it being pivoted in or to a box or block, which fits in a transverse slot in the frame, and which can be fixed in any position by a set-screw, *i*. The bar may be provided with blocks at its ends, which shall bear upon the stick that is being operated upon, and friction-rollers on the under side of the blocks may be employed to prevent it from retarding the motion of the stick, or the action of the machine.

The several parts of this improved machine are thus not only adjustable among themselves to a degree not heretofore attained in any working machine, but are capable of being readily and easily removed when necessary for repairs or other purposes. For example, in adjusting the saws, the entire feed-table apparatus may be removed, leaving the operator free to handle the blocks, nuts, &c., with the greatest convenience and ease. So, too, when desirable, the pressure can be entirely taken off of the plank by lifting the arms G G, and the whole of this apparatus may be removed if necessary.

This device is also peculiarly convenient in adjusting the presser-bar I, since, by lifting the arms, the parts to be adjusted are removed from the vicinity of the cutters, so that they can be operated upon without inconvenience or danger while the machine is working at full speed.

The pressure upon all the feed-rollers C' D' E' is adjusted by one movement of the weights L^2, and by a single movement of the lever L all said rollers can be instantaneously raised or lowered.

The permanent position of the upper rollers with relation to the lower ones is also easily controlled by the cranks or keys m^3 and their connected apparatus, while not a little inconvenience is avoided by the device for keeping the rollers parallel to each other and the device for regulating the speed of the feed-rolls.

By the use of saws properly arranged, in conjunction with cutter-heads adapted thereto, this machine will plane two planks or turn out two sets of moldings simultaneously, one at the one side of the machine and the other at the other, and by the employment of more saws a larger number of moldings might be made, each saw dividing the plank longitudinally, and the several parts thus made being molded independently, but at the same moment.

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

1. The compound lever L L^1, having a movable fulcrum, and provided with the adjustable weight L^2 and connecting-bar l^2, when constructed and arranged substantially as described.

2. The sliding frame J, provided with vertically-sliding boxes for the support of the upper feed-rollers, and combined with the spindle K, cylinder m^1, cross-shaft M, nut *k*, and crank m^3, all arranged to operate substantially as described.

3. In combination with the pivoted arms G, the frame H and pivoted presser-bar I, substantially as and for the purposes described.

4. The combination of the sliding boxes, screw-rod s^1, crank-shaft s^2, platform U, set-screw *u*, frame B', inclined bed *b*, arm *t*, rod t^1, and handle t^2, all constructed and arranged to operate substantially as described.

FRANK DOUGLAS.

Witnesses:

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