S. A. WOODS.

Planing Machine.

No. 111,894. Patented Feb'y 14, 1871.

Fig. 1.

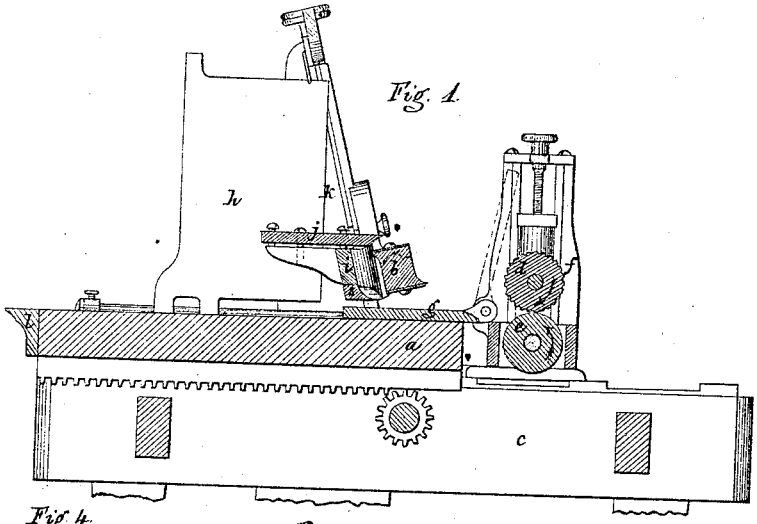

Fig. 4.

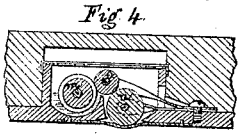

Fig. 2.

Fig. 5.

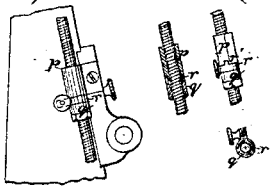

Fig. 3.

Witnesses { W. B. Crosby
Francis Gould

Solomon A. Woods

UNITED STATES PATENT OFFICE.

SOLOMON A. WOODS, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN PLANING-MACHINES.

Specification forming part of Letters Patent No. **111,894**, dated February 14, 1871.

To all whom it may concern:

Be it known that I, SOLOMON A. WOODS, of Boston, in the county of Suffolk and State of Massachusetts, have invented Improvements in Wood-Planing Machines; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

This invention relates to improvements in that class of wood-planing machines making use of cutting-knives rotated about a horizontal axis, in connection with a reciprocating bed to which lumber may be secured, said improvements being those of detail, designed to enlarge the capacities of the machine, to increase its durability, to add to the convenience with which it may be operated, to prevent wear of the parts, and to make adjustments for such wear.

As the machine on which these improvements are made is now well known, and is that patented in the United States under the number 26,902, dated January 24, 1860, and now held by me through mesne assignments, this specification will be confined as nearly as possible to the improvements which I have made thereon.

Of the drawing, which represents the aforesaid machine with my improvements added, Figures 1, 2, and 3 are vertical central longitudinal sections, exhibiting parts beyond the central sectional plane, in elevation.

In Fig. 1, the bed marked *a* (which, when stock is to be planed out of wind or twist, is, with the stock attached thereunto, made to reciprocate back and forth under the cutter-head *b*) is carried back on the frame *c* of the machine, and is left at rest, and the feed-roll frame is brought into position, when the feed-rolls *d* and *e* will be located across the frame *c*.

Heretofore, when these feed-rolls have been called into operation to present boards to the action of the cutter to surface one side thereof and to reduce them to uniform thickness, but without removing from them their curvatures and twists, the boards have been forced over the surface of the bed *a*, wearing out the true plane surface which it is desirable to maintain.

To avoid such wear of the bed *a* I attach to the roll-frame *f* a metal flap, *g*, which, when turned down so as to rest on the bed *a*, as seen in Fig. 1, has its top surface in line with the upper part of the lower feed-roll *e*, and when the feed-roll frame is removed from the front of the cutter, (as is necessary when the bed *a* is used as the means for presenting the lumber to the cutter,) then the flap *g* is turned upon its pivots, by which it is connected to the feed-roll frame, and is made to assume the position seen in dotted lines in Fig. 1. As the bed *a*, in practice, is made of wood, and is frequently reduced in thickness by being trued off by the action of the cutter *b*, the pivots of the flap *g* are made adjustable in the feed-roll frame *f*, as will be indicated by the elongated slot *g'*, seen in said frame in Fig. 2, for reception of one of the pivot-studs. Instead of making use of flap *g*, as described, a flap, *h*, for the same purpose, is shown raised in Fig. 1, and in position, resting upon bed *a*, in Fig. 2. This flap is marked *h*, and is pivoted on a rod attached by supports made adjustable on the frame *c*, for the same reason that the pivot-studs for flap *g* are made adjustable. This flap *h*, whether raised, as seen in Fig. 1, as it always is when the bed *a* is employed to carry lumber under the cutter, or whether lowered to form a bed under the cutter, as in Fig. 2, is provided with means for locking it in either position. When one of these flaps is provided the other is unnecessary.

For merely surfacing lumber I attach to the bar *i*, which connects the boxes or bearings in which the cutter-arbor runs, a bed-plate, *j*, which bed-plate is made adjustable with reference to the path of the edges of the knives of the cutter-head, and with reference to the top surface of bed *a*. When the cutter-head *b* is lowered to the position seen in Fig. 3, with the knives remaining thereon as shown, and with the direction of rotation of the head as indicated by the arrow thereon, then the preferable way to proceed to surface lumber will be to enter it at the rear of the machine, and to push it forward between the standards *k*, which hold and guide the cutter-head boxes when they are raised and lowered. The operator, in such case, will push the lumber against the cutting-strokes of the knives as sawyers push lumber against the cutting-strokes of circular-saw teeth. The cutter-head *b* is so adjusted that the surface of bed *a*, which is left

at rest in front of the head, is a tangential plane to the cylinder described by the edges of the knives, and the bed *j* is so adjusted that its top surface is below the surface of bed *a* just the amount which is to be removed in shavings from the lumber. At the rear end the bed *a* is provided with an adjustably-attached piece of metal, *l*, concaved beneath, to match the cylindrical path described by the knives, so that they project through the opening left by the adjacent edges of *j* and *l*.

If the operator desires he may so adjust the cutter that it shall project above the top surface of bed *a* a distance equal to the thickness to be removed in shavings from the lower side of the lumber, and, in that case, the bed *j* must be adjusted to a position tangential with the path described by the knife-edges. If the knife-edges and the direction of their rotating remain unchanged, then the operator must guard against having the lumber drawn from him as he presents it from the front of the machine. The edges of the knives may be turned on the head to a right-about face, and the direction of the rotation of the arbor reversed by crossing the driving-belts, and then the operator, when pushing lumber from the front of the machine over bed *a*, and the knives toward and over bed *j*, will push against the strokes of the knives, which he can resist as he feeds the lumber over the cutter-head. The wood-dust and fibers quickly absorb any oil which may be applied to lubricate the guides and ways of the reciprocating bed *a* and the frame *c*, rendering it desirable to have some reliable means for an automatic and constant though limited supply of oil to said parts, which shall be operative only while the bed *a* is in motion.

The means which I have devised and applied for this purpose are shown in section in Fig. 4.

In the bed *a*, along either side, and as frequently as may be required, are set over the guide-rails on the frame, metal boxes, in one part of which is a cavity capable of holding any desired quantity of oil.

The top of each box is open, and provided with a cover to exclude foreign matter, and to the sides of each box is so pivoted a wheel, *m*, that its lower part dips and runs in the oil-reservoir made in the box.

An opening is made in the bottom of the box, through which projects a wheel, *n*, which is pivoted to a flat spring, which may be conveniently fixed in position to the box or to the bed *a*, so as to keep wheel *n* where it will come into contact with the guide-rails on the frame, and so that it will yield to any irregularity which it may pass over. A third wheel, *o*, is also pivoted to a spring, and arranged so that it will bear upon the wheels *m* and *n*, and will yield with the latter without losing its contact with either. The wheel *m* may be covered with wicking, leather, or any soft substance, if desired, so as to increase the quantity of oil which it will carry.

It will now be obvious that, when the bed *a* is in motion, the wheel *n* will revolve when it comes into contact with the guide-rails or bed *c*, and that, when it does revolve, it will rotate wheel *o*, which will rotate wheel *m*, all by frictional contact, which will cause oil to be taken from the reservoir in the metal box and to be transferred to the guide-rails on the frame *c*; and it will also be seen that when the bed *a* is not in motion no oil will be supplied, and that, therefore, there will be no waste of oil.

Two springs, one on either side of the center of wheel *n*, are fixed to the metal boxes so as to act as scrapers on the periphery of wheel *n*, and prevent the wheel from carrying dirt or other foreign matter into the oil-chamber, one spring acting to scrape the wheel clean when the bed moves in one direction, and the other spring acting when the bed moves in the other direction.

In planing-machines the cutter is usually adjusted within small limits from some given distance from the bed more than it is at any other location, and thus the adjusting-screws become worn within said limits more than elsewhere, and allow at the worn parts of the screws a motion to the cutter which prevents the production of perfect work thereby. To remedy this difficulty I have provided the device shown in the different views embraced in Fig. 5, in which *p* is a nut, one of which is fixed to each side of the cutter-head frame. Through each nut *p* passes a screw, these being, in practice, so connected by gearing that they can be turned equally and simultaneously by hand or by any convenient motor. On each screw, and below each nut *p*, is arranged a check-nut, *q*, which can be turned hard against the lower end of nut *p*, and, when so turned, takes up the lost motion between the nut and the screw. Fitting on the upper end of each check-nut is a clamping-collar, *r*, provided with a clamp-screw, by which the nut *q* can be grasped so as to prevent its turning, there being on the collar pins or projections *r'*, which interlock in cavities made in the nut *p*.

If it is desired to raise or lower the cutter-frame to locations where the screws, passing through nuts *p* are but slightly worn, then the clamping-collar *r* and the check-nut *q* on each side are loosened, the cutter-head is adjusted at the required location, and, if necessary, the lost motion, if any exists at such location between the screws and the nuts *p*, is taken up by re-adjustment of nuts *q*, and they are kept from turning by tightening the clamps *r*. By this arrangement of the nuts *q* the cutter-bearing frame is prevented from moving upon the screws under the action of the machine, and trembling or chattering of the cutter is prevented, which, if allowed, would leave marks or ridges across the surface of the planed lumber.

The bar *i* unites the boxes and sides of the cutter-head frame, and is seen in Figs. 1, 2, and 3. The presser-bar, which is preferably made as a separate piece, adjustably attached to the bar *i*, is marked *s*, and may, if desired, have springs

interposed between it and the bar *i*, but when such springs are used they should have but slight range of movement.

In some cases the bar *i* may be so shaped as to have its lower surface in the plane formed by the action of the knife-edges, though I prefer to make use of a separate bar, *s*, so arranged that its position may be adjusted with reference to the plane formed by the action of the knives.

I claim—

1. In combination with the bed *a* a removable bed, arranged to operate in conjunction with a cutter-head and feed-rollers, substantially as described.

2. In combination with a planing-machine the described apparatus for oiling, arranged and operating as set forth.

3. The combination, with the nuts *p* and the screws working therewith, of the check-nuts *q* and clamping-collars *r*, arranged and operating substantially as set forth.

4. The combination, with the cutter-head frame, having its uniting-bar located as described, of the bearing-bar *s*, as specified.

SOLOMON A. WOODS.

Witnesses:
J. B. CROSBY,
FRANCIS GOULD.