Sheldon & Barden,

Wood Planing Machine,

No. 6,339. Patented Apr. 17, 1849.

Fig. 1.

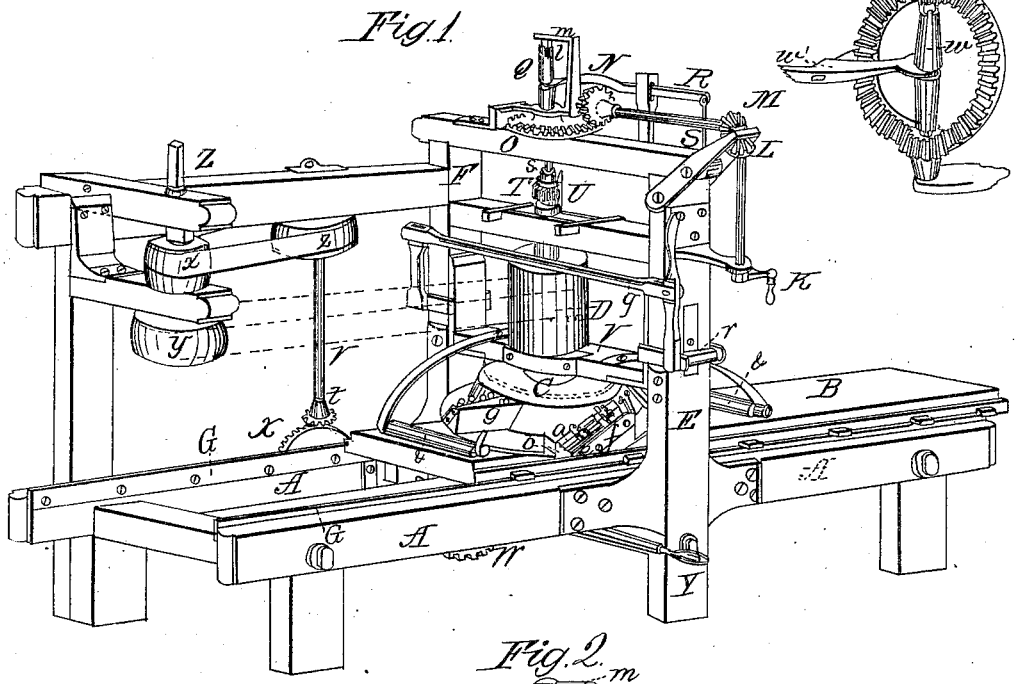


Fig. 8.

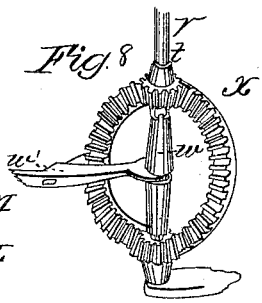


Fig. 2.

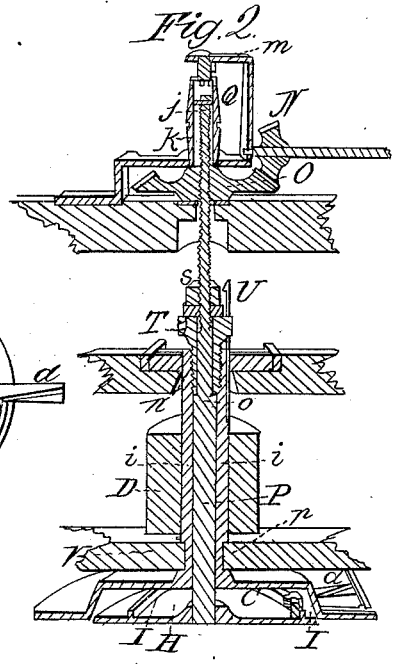


Fig. 4.

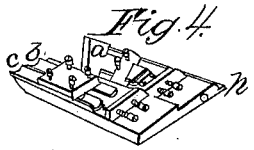


Fig. 3.

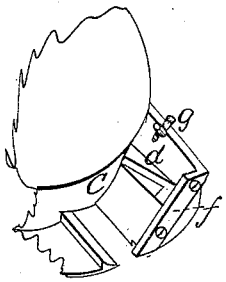


Fig. 6.

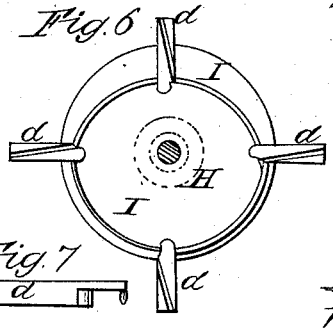


Fig. 7.

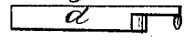
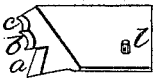


Fig. 5.



UNITED STATES PATENT OFFICE.

JOB SHELDON AND JNO. S. BARDEN, OF NEW HAVEN, CONNECTICUT.

PLANING-MACHINE.

Specification of Letters Patent No. 6,339, dated April 17, 1849.

To all whom it may concern:

Be it known that we, JOB SHELDON and JOHN S. BARDEN, both of the city and county of New Haven, in the State of Connecticut, have invented a new and useful Improvement in Machinery for Planing Boards, Plank, Timber, and other Materials which may be Cut with Ordinary Tools; and we 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, which make a part of this specification, in which—

Figure 1, is a perspective view of the whole machine, ready to be put in operation. Fig. 2, is a perspective view of a perpendicular section of the cutter wheel, cam wheel, arbors, &c., showing the cam and one of the slides with diagonal grooves. Fig. 3, is a perspective view of a section of the cutter wheel, showing one of the spaces in which one set of the cutters are placed, and one of the slides. Fig. 4, is a perspective view of one set of the cutters, showing their form, and position with regard to each other, and the manner in which they are set, and secured in their proper places by screws. Fig. 5, is a perspective view of the opposite side of the same, showing the shape and position of the cutters on the under side, and also showing the pin, or dowel, on the under side of the metallic form, which fits into the diagonal groove in the slide which draws back the set of cutters. Fig. 6, is a direct view, or plan, of the inside of the cam wheel, showing the shape, and position, of the cam on the wheel, and the slides resting on it. Fig. 7, is a direct view, or plan, of one of the slides, showing the space, in which the edge of the cam works. Fig. 8, is a perspective view of the gearing which moves the carriage, showing how the two pinions are thrown into, and out of gear.

Our improvement consists in placing the cutter wheel so that its face will run exactly parallel with the face of the carriage, or the material on the carriage to be planed; and in fitting the cutters, in sets, near the periphery of the cutter wheel, so as to cut nearly across the grain of the timber, or other material; and in using a cam on a wheel in the center of the face of the cutter wheel, (or the cam may be attached to the upper side of the cutter wheel,) which by means of slides with the diagonal grooves, draws back the sets of cutters on the side of the cutter wheel which is passing over the part which has been already planed; and in the manner of shifting this cam wheel so that the working cutters may correspond with the direction of the carriage when running either way, at pleasure; and in the method of elevating, or depressing, the cutter wheel, so as to conform to the thickness of the board, or other material, at pleasure; and in the method of moving the carriage by the use of two pinions working in the teeth of the same wheel, so that either of the pinions may be thrown into, or out of gear, at pleasure, or both may be thrown out of gear at the same time, by means of a lever acting on a cylindrical slide, with projections on each end to slip into holes, or spaces in the smaller ends of the pinions; and in having the face of the cam wheel slide along on the planed surface of the board in such a manner as to steady the board under the center of the cutter wheel, while planing it; and in so arranging the gearing that by means of a lever acting on a cylindrical slide, at the top, which by the means of spaces cut in both ends, which slip onto projections on the other parts, (so that either part may be put into gear, at pleasure,) the cam may be shifted or the cutter wheel may be elevated or depressed, by means of a crank; and in the use of a double lever working two eccentric, or cam shaped, rollers, by which the cutter wheel is firmly secured at the desired elevation.

We make the frame of the machine A, A, E, F, of suitable materials, and in the ordinary way, as seen in Fig. 1. And on the two main timbers or bars, A, and A, Fig. 1, we secure, firmly, two metallic plates, or ways, G, and G, extending somewhat above the upper surface of the main timbers, as seen at G, and G, Fig. 1, on which the sliding carriage, B, Fig. 1, rests, and is moved forward, or backward on these ways, as is represented in Fig. 1, on which carriage the board or other material, to be planed, is to be placed.

We make the cutter wheel, C, Fig. 1, of cast iron, or any other suitable material, perfectly flat on its face, except a space in the central part, to receive the cam wheel, H, Fig. 6, and the ends of the slides, *d*, *d*, *d*, *d*, Fig. 6, and *d*, Figs. 2, and 3, which slides are inserted through the raised part, C, Figs. 1, and 2, of the cutter wheel so as to rest on

the cam I, I, Figs. 2, and 6, as represented in Fig. 2. These slides are made of steel, or any other suitable material, in the form represented in Figs. 7, and 2, with a diagonal groove on the upper side, as represented in Figs. 2, 3, and 6.

We make the cutters in sets of two gouges *c*, and *b*, and one smoother, *a*, (in the shape of a rabbet plane iron,) and fit each set into a metallic form, as seen in Figs. 4, and 5, and set, and secure them in their proper positions by screws, as seen in Figs. 4, and 1. And on the back, or under, side of each of these metallic forms we have a projecting pin, or dowel, *e*, Fig. 5, which rests in the diagonal groove in the slides, d, Figs. 2, 3, and 6, so that when the slide, *d*, is drawn toward the center of the cam wheel, by the cam, I, I, Figs. 2, and 6, the form, with the cutters will be drawn back so that the edges of the cutters will not project beyond the face of the cutter wheel.

The forms, with the sets of cutters, Figs. 4 and 5, are fitted to, and secured in, spaces made in the web of the cutter wheel, from the periphery toward the center, with the smoother, *a*, Figs. 1, 4, and 5, nearest the center, as seen in Fig. 1. And these forms are secured to the cutter wheel by the side pieces or clamps, *f*, Figs. 1 and 3, by screws, the whole as represented in Fig. 1, and they are regulated, as to their cut, by the screw, *g*, Figs. 1, and 3, being inserted into the hole *h*, Fig. 4, to the required distance. We use as many sets of cutters as the size of the cutter wheel will well admit of; and the diameter of the cutter wheel should be about twice the width of the board, or other material, to be planed, so that the cutters work, substantially across the grain of the timber.

We make the cam wheel, H, Fig. 6, of cast iron, or other suitable material, round, and of somewhat more than half the diameter of the cutter wheel, so as to fit the space in the face of the cutter wheel, as seen in Fig. 2, and on the upper side we have a cam, I, I, raised, as seen in Figs. 6, and 2, (or it may be sunk, or grooved if found more convenient in any case). This cam is situated at equal distance from the periphery of the cam wheel for about three eighths of a circle, and for the remainder of the circle it inclines more toward the center of the cam wheel, as seen in Fig. 6. Or the cam may be situated on the upper part of the cutter wheel, as represented by the dotted lines, at C, Fig. 1, and the slides, *d*, *d*, *d*, *d*, Fig. 6, must be appropriately connected with both the cam, and the forms holding the cutters. Or a circular rim may be attached to the beam, V, Fig. 1, elevated on one side of the cutter wheel and depressed on the other, to which slides, (or other appropriate apparatus,) must be connected to draw back the forms holding the sets of cutters; and either of these arrangements may be readily shifted so as to plane either way, when necessary; but, for various reasons, we recommend having the cam connected with the cam wheel, H, as represented in Figs. 6, and 2.

When the cam is attached to the cam wheel as above recommended, we shift the cam wheel half way round by turning the crank, K, Fig. 1, once around, as the pinions L, and M, Fig. 1, have an equal number of teeth, and the pinion, N, has half the number of teeth of the wheel, O, Figs. 1, and 2.

We connect the cam wheel, H, Figs. 2, and 6, with the before described gearing, by means of the shaft, P, Fig. 2, which passes through the hollow shaft, *i*, *i*, Fig. 2, and *i*, Fig. 1, of the cutter wheel, and tap it through the center of the wheel O, Figs. 1, and 2, and allow it to pass above the wheel, O, through a hollow cylindrical slide, Q, as represented in section in Fig. 2.

Through the upper end of this shaft, P, we insert a pin, *j*, Fig. 2, which projects on one side to fit into a groove, *k*, Fig. 2, in the inside of the hollow cylindrical slide, Q, to prevent the shaft from turning in the slide. In both ends of this hollow cylindrical slide we cut spaces, like those seen at *l*, Fig. 1, and make corresponding projections on the upper side of the central part of the wheel, O, so that when the slide Q, is forced down by raising the lever, R, Fig. 1, the slide Q, and the shaft, P, will be turned with the wheel, O, by turning the crank, K, and thus the cam wheel, H, Figs. 6, and 2, will be shifted without altering the elevation of the cutter wheel, C, Fig. 1.

When we wish to elevate, or depress the cutter wheel, C, Fig. 1, we bear down the end of the lever, R, Fig. 1, so as to raise the hollow cylindrical slide, Q, so that the spaces at *l*, Fig. 1, will pass onto the projection *m*, (which will prevent the slide Q, and the shaft, P, Fig. 2, from turning,) then by turning the crank, K, Fig. 1, the wheel, O, will be revolved on the screw part of the shaft, P, Fig. 2, and thereby the cutter wheel will be elevated, or depressed, as the crank, K, is turned one way, or the other.

The lever, R, Fig. 1, may be secured in its appropriate position, elevated, or depressed, by the rod, S, Fig. 1, extending down, and the lower end being made fast to pins projecting from the edge of the post, E, Fig. 1, or in any other convenient way.

To prevent the cutter wheel, C, from pressing on the cam wheel, H, and yet to set them sufficiently near each other, we insert a hollow screw, *n*, Fig. 2, into the upper end of the hollow shaft, *i*, *i*, Fig. 2, of the cutter wheel, so that the lower end of the hollow screw, *n*, may rest on a bearing,

at *o*, Fig. 2, on the shaft, P, of the cam wheel, as seen in Fig. 2. The upper end, or head, T, Figs. 1, and 2, of this hollow screw is cut into leaves, (as a pinion,) and is secured from being turned, (after it is properly set,) by the action of the machinery, by means of a spring catch, U, Figs. 1, and 2, which rests between the pinion leaves as represented in Figs. 1, and 2. And to prevent the cutter wheel from being raised up so as to disengage the slides, *d*, *d*, *d*, *d*, Fig. 6 from the cam, we place two nuts, screwed tight together, on the screw part of the cam wheel shaft, P, immediately above the head, T, of the hollow screw, *n*, as represented at *s*, in Figs. 2, and 1.

To prevent the cutter wheel, C, Fig. 1, from being thrown up out of its place by knots, or other hard, or irregular spots, in the board, or other material, being planed, we place a sliding beam, V, Figs. 1, and 2, on a journal, *p*, turned on the hollow shaft, *i*, *i*, Fig. 2, of the cutter wheel; which beam is secured, at each end, against the posts, E, and F, Fig. 1, by the action of a double lever, *q*, Fig. 1, which works two eccentric, or cam shaped, rollers, one of which is represented at *r*, Fig. 1.

The carriage B, is moved back and forth, on the ways, G, and G, Fig. 1, by a common rack, on its under side, through the center, by means of a revolving toothed wheel, W, Fig. 1. The arbor of this wheel is turned by a bevel gear wheel, X, Figs. 1, and 8, which is on the end of the arbor of the wheel, W, and is worked by two conical pinions, *t*, and *u*, Fig. 8, which pinions are placed on round journals on the shaft, or arbor, *v*, Figs. 1, and 8, so as to move freely, and can be thrown into, or out of, gear, at pleasure, by the lever, *w'*, Fig. 8, (which is worked by the lever, Y, Fig. 1,) by means of a hollow cylindrical slide, *w*, Fig. 8. This hollow cylindrical slide, *w*, Fig. 8, is secured from turning on the shaft, *v*, Figs. 1, and 8, by means of a pin which passes through the shaft, with one end of it projecting so as to fit into a groove, like *k*, Fig. 2. This slide has projection on each end, as seen in Fig. 8, which fit into holes, or spaces, in the smaller ends of the pinions, *t*, and *u*, Fig. 8, by means of which either of the pinions may be caused to turn with the shaft, *v*, or both may be allowed to run free; so that the same motion of the other machinery will move the carriage B, either way, as may be desired.

The machine is put in motion by a driving pulley placed on the upper end of the shaft Z, Fig. 1, on which shaft are two other pulleys *x*, and *y*. From the pulley, *x*, a band, *x*, *z*, passes around the pulley, *z*, to move the carriage, B, and another band, *y*, D, passes from the pulley, *y*, around the pulley, D, as represented by the dotted lines, to revolve the cutter wheel, C, all as represented in Fig. 1. The board, or other article, is held steady, while planing it, by means of two anti-friction rollers, *v*, *v*, Fig. 1, pressed down by two curved springs attached to the upper side of the beam V, as seen in Fig. 1, or by any other convenient method, and by the face of the cam wheel, H, Fig. 6, in the central part of the face of the cutter wheel, C, as it is represented, in section, in Fig. 2. We set, and secure, the cutters in their proper position; and turn the cam wheel so that the part where the circular portion of the cam lies at equal distance from, and nearest to, the edge of the cam wheel, may be in the direction from which the board, or other article, is fed, so that the cutters may cut on that part, and lie drawn back on the opposite side of the cutter wheel; and adjust the cutter wheel to the required elevation; and put the proper pinion in gear to move the carriage in the right direction, and then set the machine in motion, when the gouge cutters will rough up the board, and the smoothers will smooth it, as the carriage is carried through.

When it is desired to dress the board, or other material thinner than can be done by passing it through the machine once, the cutter wheel must be depressed by turning the crank K, Fig. 1, in the proper direction, (when the cylindrical slide, Q, Fig. 1, is forced up to the top,) and, (with the cylindrical slide forced down,) shift the cam, by turning the crank, K, exactly once around; throw the other pinion into gear to move the carriage in the opposite direction, and set the machine in motion as before; when the carriage will be moved back and the cutters on the side of the cutter wheel toward the feed will cut, while on the other side they will be drawn back; so the machine will work equally well either way, as may be found most convenient, in any particular case, so that the boards, or other article, may be fed alternately at each end, thereby, losing no time in running back the carriage.

To joint boards, or other articles we clamp them together in a convenient quantity and set them on the carriage, and joint first one edge and the other, by which method we bring them to an equal width.

Our machine is equally well adapted to the dressing of stone, iron, brass, or any other substance which can be cut with ordinary tools, by simply inserting the appropriate cutters.

Our machine may be worked by any convenient power; and even by man power, two men being able to do, at least, the work of ten men with hand planes.

The advantages of our improvement over all other methods heretofore used, or known consist in the use of the cam, and slides with

diagonal grooves, to govern the cutters, by moving them back and forth, to, and from, the work, on the opposite sides of the cutter wheel, so that we can set the face of the cutter wheel exactly parallel with the face of the carriage, (whether horizontal, vertical, or inclined,) so that we are able to plane the surface perfectly flat, without any risk of scratching the finished surface, as would be the case in all other machines, of similar construction, if the face of the wheel were set parallel with the face of the carriage.

And in the method of elevating and depressing, the cutter wheel, whereby we are able, with the same machine, without any other alteration, to plane stuff of one fourth of an inch to two feet, in thickness, with equal convenience, and accuracy; and with no greater delay than is required to turn a screw, through that distance, with a crank. And securing the cutter wheel at its proper elevation, at all times, by means of the beam, and double lever acting on the two eccentric, or cam shaped, rollers. And in the method of moving the carriage both ways, so that by shifting the cam wheel, as before described, the machine may be kept cutting without losing any time in running the carriage back, as is now necessarily done in all other machines, where an endless chain carriage is not used, (which endless chain carriage may be used in our machine when deemed more convenient.) And in having the cam wheel slide along on the planed surface of the board, or other material, so as to steady it under the central part of the cutter wheel, which with the anti-friction rollers, before and behind the cutter wheel, will hold the article being planed more effectually steady than any method heretofore used.

We are aware that planing machines have been made with cutters on the face of the cutter wheel; but in such cases the face of the wheel has been, necessarily, set slightly inclined to the face of the carriage to prevent the cutters scratching the surface which had been already planed, and therefore would leave the article slightly hollowed out in the center, throughout its whole length. And that cams have been used to regulate the cutting of cutters, in machines used for various purposes. And that the cutter wheel has been so situated as to be susceptible of being slightly elevated and depressed. And that pinions have been so arranged as to be thrown into, and out of, gear, at pleasure. And that double levers acting on eccentric rollers have been used as binder in machinery. And that anti-friction rollers have been used to steady the board while being planed. We therefore claim none of these, as such, as our invention. But

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

1. The method of governing the sets of cutters by the use of a cam in the central part of the cutter-wheel, (whether above or below,) which will move the slides with diagonal grooves, so as to draw back the sets of cutters on one side of the cutter wheel, while those on the opposite side are cutting, that is, drawing back each set of cutters, alternately, soon after it leaves the edge of the board, or other article, being planed, so as to avoid scratching the planed surface as it is coming out from under the cutter wheel; while the face of the cutter wheel is parallel to the face of the carriage.

2. And the combination of the method of shifting the cam so as to plane equally well when the carriage is running either way with the method of elevating, and depressing, the cutter wheel, to conform to the thickness of the board, or other material being planed, the whole constructed, arranged, combined, and operating, and for the purposes, substantially, as herein described.

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Witnesses:
EDWIN MARBLE,
R. FITZGERALD.