O. Wright,

Reciprocating Saw Mill.

No. 7,011. Patented Jan. 8, 1850.

Fig. 2.

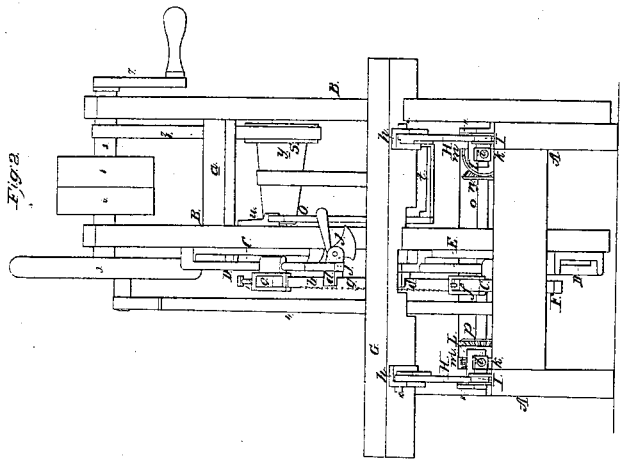


Fig. 5.

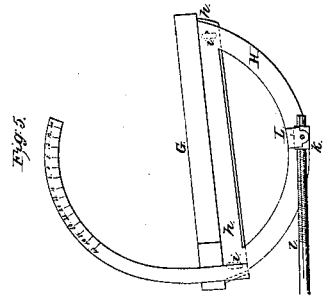


Fig. 3.

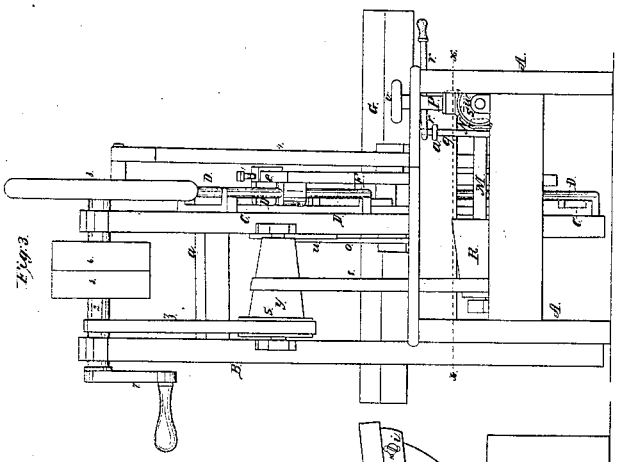


Fig. 1.

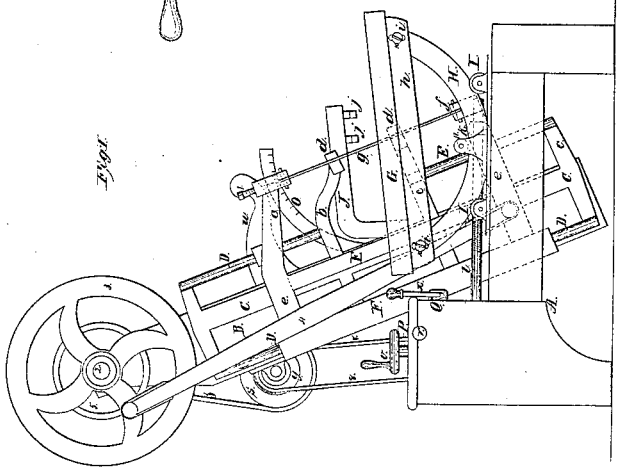
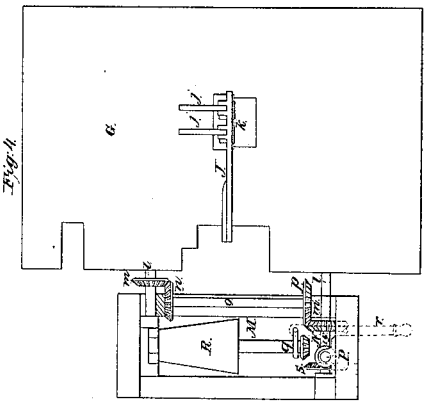


Fig. 4.



UNITED STATES PATENT OFFICE.

OLIVER WRIGHT, OF ROCHESTER, NEW YORK.

MILL FOR SAWING IRREGULAR FORMS.

Specification of Letters Patent No. 7,011, dated January 8, 1850.

To all whom it may concern:

Be it known that I, OLIVER WRIGHT, of Rochester, in the county of Monroe and State of New York, have invented a new and useful Improvement in the Machine for Sawing Ship-Timber and for other Purposes, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification, in which—

Figure 1, is a side elevation of the machine, Fig. 2, is a front elevation of the same, Fig. 3, is a view of the back part of ditto, Fig. 4, is a horizontal section of the back part of the same, at the line *x*, *x*, of Fig. 3, showing the cogged gearing, for moving the table, on which the timber is placed, and a top view of said table, and Fig. 5, is a section of the table and index plate.

Similar letters in the several figures, refer to corresponding parts.

The nature of this invention and improvement consists, in securing the saw in an inclined sliding frame, and arranging at the lower part of the same, a vibrating table or platform, having segmental plates or bars secured to its lower surface, by screws passing through slots formed in the same, the lower edges of which plates or bars rest on friction rollers, turning in the frame of the machine, over which they are moved by a combination of bevel cog wheels, screw and other shafts, bands and pulleys, in such a manner as to cause the surface of the table or platform to assume any required angle, with the line on which the saw moves, in order to give a corresponding bevel or miter to the timber being sawed, and to admit of the table, being raised or lowered on the segmental plates or bars, to accommodate itself to any thickness of timber, so as to always keep the center, of which the segmental plates or bars forms the arcs of circles, on a line with the line upon which the saw moves, and midway between the upper and lower surfaces of the timber being sawed, to prevent the saw, binding on its sides.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is the frame, made of suitable size, strength and material, consisting of two side timbers raised at their back parts and connected together at their ends, by suitable timbers, and supported on four posts; B is an inclined frame, composed of two parallel timbers secured at their lower ends to the frame A, so as to incline over the back part of the same at an angle of about 65 degrees, with a horizontal plane, and connected together by cross timbers (*a*) above and below;

C is an oblong cast iron frame, secured on the side of one of the inclined timbers of the frame B, and having a curved arm (*b*) projecting from its front edge, near its center, and straight arms (*c*) projecting, one from its lower part and the other above the same, the upper one of which extends forward a like distance from the inclined frame B with the curved arm (*b*) and both having blocks of wood (*d*), secured on their sides at their forward ends, having slits made in their faces, in which the saw moves, for guiding the same;

D are round inclined guides, secured to projections formed at the upper and lower ends of the metallic frame C, and running parallel thereto, one being beyond the forward edge and the other at the back edge of the same, and both running its full length. E is another round inclined guide, secured to the arms (*c*), projecting from the metallic frame near the outer ends of the same, and extending from one to the other, parallel to the guides D.

F is a sliding frame having boxes on its sides, which surround and move over the inclined guides D, E. This frame consists of two parallel timbers or bars F, connected together at top and bottom by ties (*e*), which extend outward the same distance beyond the inclined frame B as the bars or arms (*b*, *c*,), having oblong metallic boxes (*f*), slipped over their outer extremities, projecting below and above the respective surfaces of said projecting ties (*e*), and slit to receive the ends of the saw (*g*), which are inserted in the same and keyed by pins passing through openings in the saw, and resting against the inner surfaces of said boxes (*f*)—the tension of said saw being regulated by a screw (*l*) passing through the upper part of the upper box, and pressing against the surface of the upper tie (*e*).

G is a vibrating table or platform upon which the timber to be cut is placed, having a recess formed in its back edge, and provided with ribbed plates (*h*), secured to

near the sides of its lower surfaces and parallel to the same, the ribs of which plates project a sufficient distance from their lower surfaces to admit of slots (*i*), running at right angles thereto, being formed near their ends, sufficiently long to adapt the table to the different sized timber to be cut.

H are segmental plates or bars placed on edge, and secured at their extremities, to the sides of the ribs of the plates (*h*), by means of screws (10) passing through the slots in the ribs, and entering female screws in the segmental bars or plates, their heads binding on the surface of the ribs.

I are friction rollers, having grooves in their peripheries, in which the segmental plates H rest and move, the axles of which rollers turn in ears raised from metallic plates, secured to the upper surfaces of the side timbers of the frame—other rollers (11) turning on shafts or studs projecting from projections or ears, rising from said metallic plates, are arranged above the upper edges of the segmental bars or plates, and bearing against the same midway between the rollers I, for keeping said segmental plates or bars in their places during their movements.

J is a bent bar, secured to the side of the recess formed in the table or platform, and extended upward and forward and over the same, to beyond its center, being provided at near its forward end with right angled levers (*j*), turning in fulcrums at their bend or apex, between ears, projecting from said bent bar J, and widened at their lower ends, and curved eccentric with the centers upon which they move, in such a manner as to adapt their lower surfaces to the upper surfaces of any thickness of timber, as it is passed over the table, and prevent its being raised from the same during the upward movement of the saw; the gravity of the other ends of the said levers, causing their curved surfaces to be always kept in contact with the timber.

K are rollers turning in boxes in the square opening in the table, through which the saw passes, the peripheries of which project a slight distance above the surface of the table, for facilitating the passage of the timber over the same.

L are projections formed on the inner sides of the segmental plates or bars, midway between their ends, having recesses in their lower surfaces in which are placed rectangular blocks of metal or nuts (*k*), turning on axles in said projections L, and having female screws formed in them, in which work screw shafts (*l*) passing through the same, and running to the back part of the machine, parallel to the sides of the same, one extending some distance beyond the other, and both being provided with bevel cog wheels (*m m'*), at their back parts, the bevel wheel (*m*) on one, being situated slightly in advance of the bevel wheel (*m'*) on the opposite one, and meshing in gear with the front part of a similar sized bevel cog wheel (*n*), on the extremity of a horizontal shaft (*o*), running parallel to the back part of the frame A, and from one screw shaft (*l*), to the other, while the bevel wheel (*m'*), meshes in gear with the back part of another bevel cog wheel (*p*), on the opposite extremity of said shaft (*o*). The bevel wheel (*m'*), is beveled and cogged on its front, as well as its back part. M is another horizontal shaft turning in a stationary box in the frame at one end immediately back of the shaft (*o*), and supported at its opposite extremity by a curved bar (*q*), in an opening in which it turns, extending downward and attached at its lower end, to a beam of the frame, by a bolt upon which it has a vibratory movement, and extending upward from the shaft M, in a curved direction, to near the top of the enlarged part of the frame, where it is attached to the end of a lever (*r*), by its end, which is rounded, being inserted through an opening in the same, extending horizontally through a slot to the outside of the frame, being provided at its outer end with a handle, and turning on a fulcrum at its center, said fulcrum being fixed permanently to the frame A.

N is a bevel cog wheel, secured on the movable end of the horizontal shaft M, and capable of being made to engage with either the back part of the bevel cog wheel (*m'*), on one of the screw shafts, or with a bevel cog wheel (*s*), on the extreme end of said screw shaft *l*, by moving the lever (*r*) in order to reverse the motion of the screw shaft, and consequently the movement of the table or platform.

O is a segmental plate, whose arc forms a quarter of a circle, graduated on its face with marks and figures, indicating degrees, curving upward over the table through the recess formed in the back part of the same, and secured at its lower end to a horizontal metallic bar (*t*), extending under the table to one of the metallic segmental plates, or bars H to which it is firmly secured. The upper end of this segmental bar is situated immediately over the center of the table or platform, and its upper part passes through a slot formed in the front part of a plate (*n*), secured to one of the timbers of the inclined frame B, so that as said segmental plate passes through said slot in the sharpened edge of the plate on the side of the same, the angle formed by the saw with the surface will be indicated by said sharpened edge of the plate, pointing to the corresponding degree on the graduated plate O.

P is a vertical shaft turning in boxes in the raised part of the frame A, and near

one side of the same, having a shoulder, which rests on the lower box to prevent it descending, and a wheel and handle (v), at its upper end, above the frame, by which it is revolved, and provided with a bevel cog wheel (w), at its lower end, which meshes in gear with the bevel cog wheel on the end of the screw shaft, for giving motion to the screw shafts, when it is desired to give an irregular or quick motion to the table.

Q is a horizontal bar, secured at one end to the upper end of the curved bar, and extending forward through a slot in the raised part of the frame A and notched on its lower edge near its forward part, and passing over a spring bar x secured on the front part of said raised part of the frame, said spring being pressed upward against the notched surface of the horizontal bar o, and entering the notches in the same, and being bent upward at its movable end, and provided with a handle, for disengaging the spring bar x from the notched bar Q.

R is a drum of the form of a frustum of a cone, secured on the horizontal shaft M, near its stationary end, around which drum is passed a band (8), leading upward and extending over another drum (y) of a similar size and form to the drum R, but arranged in a reversed position to the same—the larger end of the upper one, being over the smaller end of the lower one, and vice versa, said upper drum (y), being secured on a horizontal shaft turning in boxes, in the back part of the inclined frame B. The design in having these drums R, (y), of the form represented, is to move the band over the surfaces of the same toward either end, to regulate the speed of the movement of the table or platform.

S is a pulley, secured on the same shaft as the upper drum (y), and next the large end of the same around which is passed a band (z), extending upward and passing around a horizontal shaft (2), turning in boxes at the top of the inclined frame B, on one end of which is secured a fly wheel (3), having a wrist on its side, to which is attached the end of a connecting rod (4), extending downward, and attached at its lower end to a pin projecting from the lower tie (e) of the sliding frame F. This shaft (2) is provided with a tight and loose pulley (5, 6), around which may be passed a band leading to any convenient motive power, and a crank (7) at its end, for turning the same.

The mode of operation is as follows: When it is desired to saw timber at one uniform bevel or miter, the lever (r) will be moved so as to bring the bevel cog wheel N, on the end of the shaft N midway between the bevel cog wheels (m', s,) so as to prevent the screw shafts (l) and table G from being moved. The table or platform G being brought to the proper angle in relation to the saw (g) and then raised or lowered as the case may be, from or toward the segmental plates or bars H in order to bring the center of the timber to be sawed—that is a line midway between its upper and lower surfaces,—on a line with a center point, of which said segmental plates or bars H form arcs of circles, which center point is intersected by the saw: and the table or platform, being clamped to this position, by the screws (10) passing through the slots (i) in the ribs on the plates (h) and entering corresponding female screws in the segmental plates or bars;—motion is communicated to the shaft at the upper part of the inclined frame B by the application of horse steam or water power to the drum (5) on the same, or to the crank (7) which will cause the sliding frame F, with the saw to be moved up and down over the inclined slides D, E, by the connecting rod 4. The timber is then placed on the table or platform G, immediately in front of the saw and is forced toward the same by hand or other power, passing over the rollers K, which facilitate its progress, and under the eccentric surfaces of the right angled levers (j) which prevent it from being raised by the upward movement of the saw, until it is sawed the required length.

In case it is desired to saw the timber to a curvilinear form the crank v and upright shaft P, to which it is attached, is turned either to the right or left, so as to turn the screw shafts (l) by means of the bevel cogged gearing—the one to the right and the other to the left, so as to bring the upper surface of the table G to the required angle in relation to the line upon which the saw moves, which is to form the bevel or miter of the commencement of the curve, as indicated by the sharpened edge of the plate (u) and the graduated segmental bar O, say for instance, that the bevel or miter of the commencement of the cut of the saw through the timber, is to form an angle of five degrees with a perpendicular line, and that the angle is to be gradually and equally increased five degrees in every five feet the saw passes through the timber. The operator will turn the crank until the degree marked on the graduated segmental plate or bar O, stated above, is brought opposite the sharpened edge of the plate (u) and will force the outer end of the lever (r) back so as to bring the bevel cog wheel N, on the end of the shaft M in gear with the bevel cog surface of the wheel (m') so as to cause the screw shafts (l) to be turned one to the left and the other to the right, when motion is given to the machine to give the required movement to the table or platform, and will moreover move the band 8 over the surfaces

of the drums R (*y*) of the form of a frustum of a cone, until the relative diameters of the parts of said drums over which said band passes, will in his judgment give the required degree of speed suited to the speed with which the timber is fed to the saw. The timber previously marked with transverse lines, and the line upon which the saw is to cut, will then be moved past the saw as before stated,—the operator being careful to observe that the movements of the graduated segmental plate O, past the sharpened edge of the plate (*u*) and the movement of the timber toward the saw shall correspond with the curvilinear form to be given to the timber,—or in other words, that the relative speeds of the timber and table in relation to the saw shall be such as to give an increase of bevel or miter to the timber of five degrees in every five feet of its progress toward the saw.

By raising the table or platform G from the segmental plates or bars H, so as to make its upper surface conform with the thickness of the timber to be cut, by means of the screws (10) passing through the slots (*i*) in the ribs (*h*) and entering said segmental plates or bars H as before stated, the saw (which at all times intersects the center, of which the said segmental plates or bars are arcs of circles, without regard to position) can be likewise made to intersect a point midway between the upper and lower surfaces of the timber being cut, at the very point where it passes the segmental plates or bars and hence the parts of the saw in the timber, above and below these points will be equal, thus preventing all transverse strain on the saw. In case it is desired to saw an irregular curve,—that is,—a curvilinear surface partly beveling on its surface, any number of degrees on one side of a perpendicular line and beveling any given number of degrees on the opposite side of the said perpendicular, the operator moves the handle of the lever (*r*) forward, and disengages the bevel cog wheel N from the two bevel wheels (*m'*, *s*,) on the screw shaft and after setting the table to the proper angle in relation to the saw, required for the commencement of the bevel on the timber, gives motion to the machine and forces the timber against the saw and at the same time turns the crank shaft P either way to move the table to the proper angle with the saw to cut the timber to the required bevel as it passes the same.

I claim—

The mode of raising and lowering the table or platform G on the segmental plates or bars H, for adapting the same to any thickness of timber to be cut, and keeping the middle of the timber, between its top and bottom, always in a line with the center of which the segmental plates or bars H form arcs of circles, through which (the center) the saw passes, to prevent it from binding in the timber when sawing a curvilinear surface, by means of the ribs (*h*) having slats (*i*) near their ends through which the screws (10), which enter the segmental plates or bars H pass in the manner herein described.

OLIVER WRIGHT.

Witnesses:
EDWIN BROWN,
MATTHIAS MOOT.