

M. Ingalls,
Converting Motion.

N^o 5,015.

Patented Mar. 13, 1847.

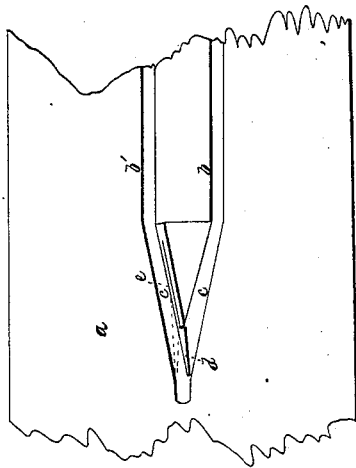


Fig. 3.

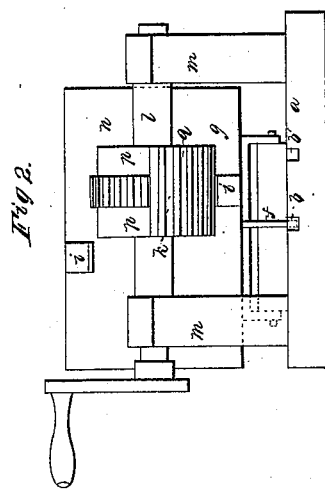


Fig. 2.

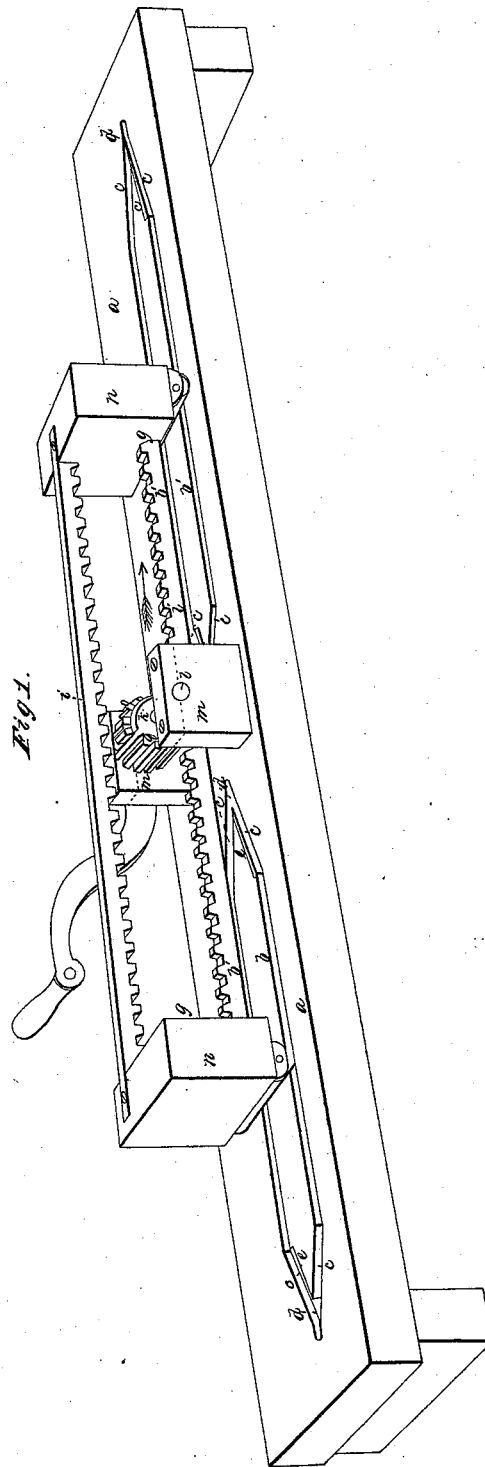


Fig. 1.

UNITED STATES PATENT OFFICE.

MOSES INGALLS, OF BURLINGTON, PENNSYLVANIA.

MODE OF PRODUCING RECIPROCATING AND LATERAL MOTIONS.

Specification of Letters Patent No. 5,015, dated March 13, 1847.

To all whom it may concern:

Be it known that I, MOSES INGALLS, of Burlington, in the county of Bradford and State of Pennsylvania, have invented a new and useful Method of Producing Rectilinear Reciprocating Movements for Reciprocating Planing-Machines and for other Purposes, and that the following is a full, clear, and exact description of the principle or character which distinguishes it from all other things before known, and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of the mechanism; Fig. 2, a cross vertical section; and Fig. 3, a sectional plan.

The same letters indicate like parts in all the figures.

The object of my invention is to produce a rectilinear reciprocating motion, which shall shift at each end to make the back movement in a different plane from the forward one but parallel with it. And the nature of my invention consists in having a pin or roller at each end of the carriage which moves back and forth to run alternately in two sets of parallel grooves which, at the ends, run diagonally into each other, and provided at each of their junctions with a spring switch so that at the end of each motion the pins shall open the switches to run into the return grooves, and vice versa; the carriage being provided with two racks one above and the other below with their cogs facing each other to be acted upon alternately by the same pinion the two racks being on opposite sides of a vertical plane, that one rack may pass by the side of the pinion, while the other is in gear with and actuated by it, and the pinion being so made as to have the cogs extend over its whole length for about half its circumference and for the other half over only the middle third of its length, so that as the carriage is shifted by the diagonal ends of the grooves the rack that is not in gear may pass over the part of the pinion that is without cogs, as it is being shifted onto the middle sections provided with cogs around its entire periphery preparatory to the return motion, the other rack at the same time passing off over the other cogless portion of the pinion when it is thrown out of gear.

In the accompanying drawings, (a) rep-

resents the bed of the machine, and (b, b, and b', b',) two sets of parallel grooves cut or otherwise formed therein. These grooves run diagonally into each other at (c, c, c, c,) and where the diagonal parts run into each other, there is a switch (d) attached to a spring (e) to admit of the passage of a pin (f) (that projects downward into these grooves from a carriage (g)) from one set of grooves into the other. The carriage (g) consists of two end blocks (n, n,) connected together by two parallel racks (i, i,) placed on each side of a vertical plane so that when the carriage is moved in one direction by a pinion (k) on the horizontal shaft (l) that has its bearings in two standards (m, m,) the other will move by the side of the pinion and thus avoid the contact of the cogs. As the carriage is carried in the direction of the arrow by the rotation of the pinion acting on the lower rack, the pins (f, f,) (only one seen in the drawing) that project from the lower surface of the carriage run in the two grooves (b, b,), and toward the end of this motion these pins run in the diagonal parts of the grooves, force open the spring switches (d, d,) and pass into the diagonal part of the grooves (c, c,) preparatory to the return motion, and at the same time this lateral motion disengages the lower rack from the cogs of the pinion and engages the upper rack, which carries the carriage back to the other end where a like operation takes place to reshift the carriage, &c. As the carriage is shifted by a diagonal motion at the end of its courses, the pinion (k) is formed with the cogs extending for about one-half of its circumference (q), the whole length of the pinion, and on the remaining portion (o,) only one third of its length and in the middle, leaving a vacant space (p, p,) on each side over which the racks pass during their lateral motion, so that the sectional cogs on one side shall begin to act on the rack to be engaged as the other leaves the pinion on the other side, and before the lateral motion shall have shifted this engaging rack sufficiently to be acted upon by the middle section of the pinion. In this way a small pinion may be used to give any desired extent of motion to the carriage, which could not be the case if a segmental pinion alone were used as in the method heretofore practiced.

From the foregoing it will be perceived that the first part of my invention may be

carried into effect without the latter, by simply using a segmental pinion which will first act on one rack to carry the carriage in one direction and then on the other for the return. But for long motions, this is very objectionable on account of the great diameter of pinion required. Or instead of a segmental pinion, the first part of my invention may be carried into effect by the means of the well known mangle wheel motion, but this is objectionable on account of complexity and liability to derangement.

When this invention is to be applied for planing by a reciprocating motion, appropriate planing irons or bits may be attached to the end blocks of the carriage to act on the boards or plank placed on an appropriate frame which need not be described as it makes no part of the invention for which I now seek to procure Letters Patent; but it will be obvious that the lateral motion given to the carriage at the end of each motion will relieve the planes and permit them to return clear of the surface of the board.

What I claim as my invention and desire to secure by Letters Patent is—

1. The method substantially as herein described of giving to the carriage a reciprocating rectilinear motion in combination with the lateral motion at each end of its course by means of the straight grooves in combination with the diagonal grooves at each end and the spring switches, substantially as described.

2. And I also claim the method substantially as described of giving the reciprocating motions of any desired extent and greater than the circumference of the actuating pinion by placing the two racks on each side of a plane at right angles to the axis of the pinion, in combination with the pinion, having cogs entirely around its circumference in the middle of its length, and segments of cogs on each side as described.

MOSES INGALLS.

Witnesses:

J. W. THAYER,
J. H. KELLER.