2 Sheets, Sheet 1.

Absterdam & Merrill,

Wood Planing Machine.

No. 10,703. Patented Mar. 28, 1854.

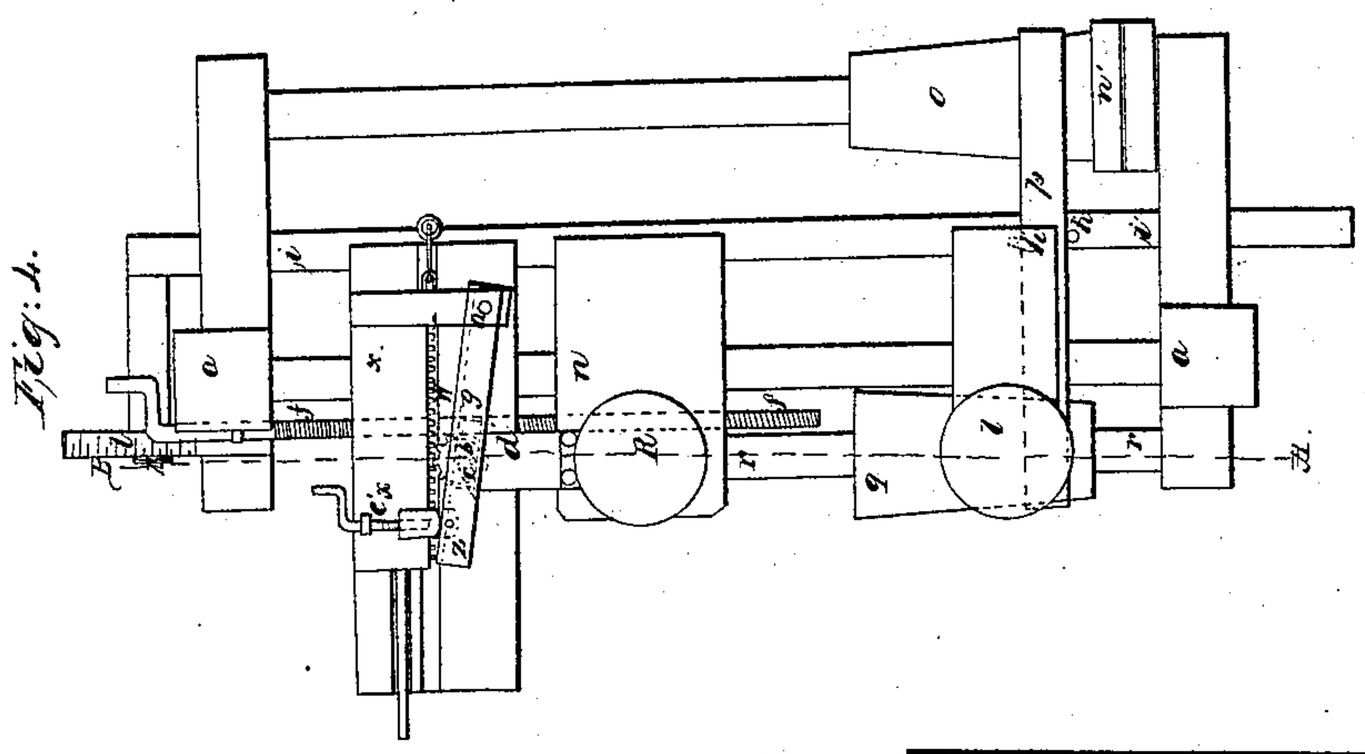


Fig: 1.

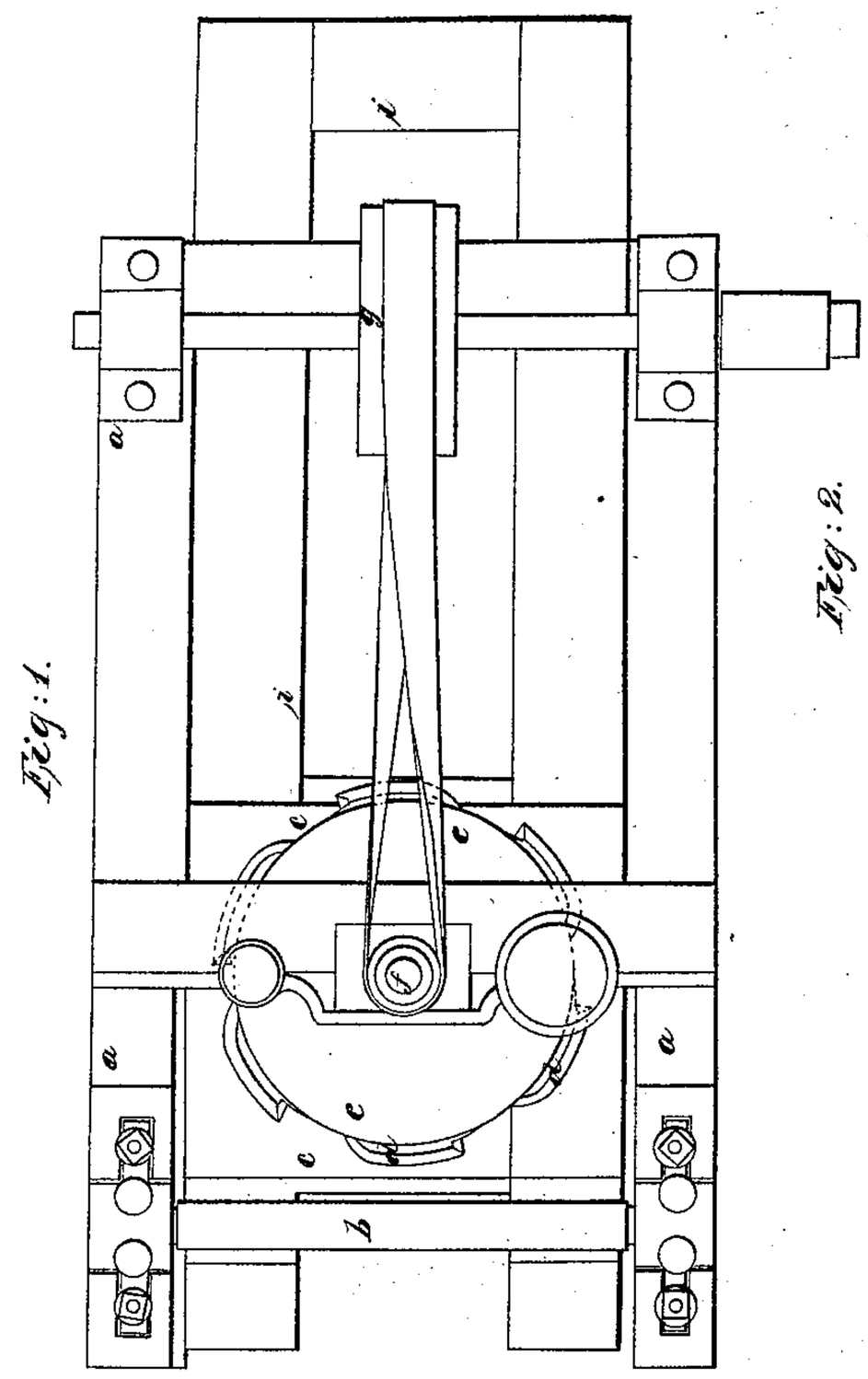
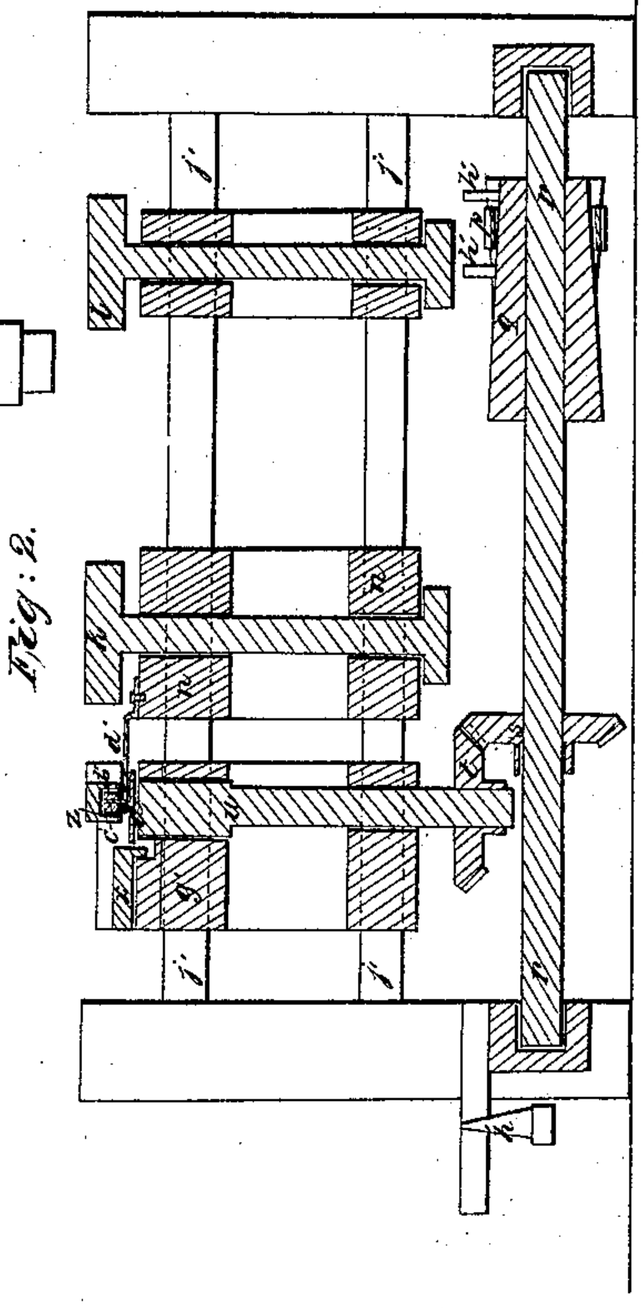


Fig: 2.



2 Sheets Sheet 2.

Absterdam & Merrill,

Wood Planing Machine.

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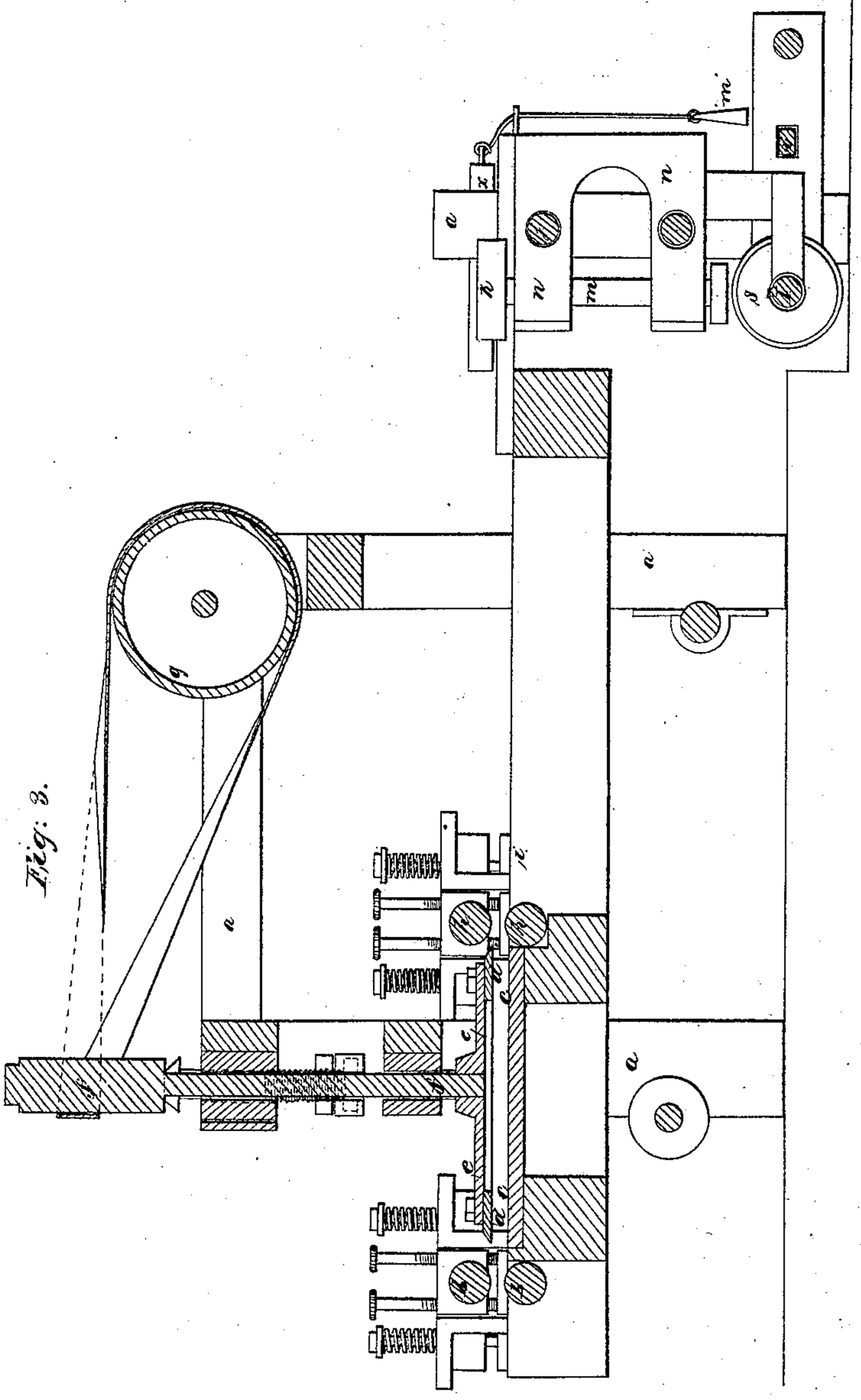

UNITED STATES PATENT OFFICE.

JNO. ABSTERDAM AND WM. B. MERRILL, OF BOSTON, MASSACHUSETTS, ASSIGNORS TO JAS. A. WOODBURY AND W. B. MERRILL, OF WINCHESTER, MASSACHUSETTS.

DEVICE FOR TONGUING AND GROOVING TAPERING BOARDS.

Specification of Letters Patent No. 10,703, dated March 28, 1854.

To all whom it may concern:

Be it known that we, JOHN ABSTERDAM and WILLIAM B. MERRILL, both of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Machines for Tonguing and Grooving and Planing Boards, and that the following description, taken in connection with the accompanying drawings, hereinafter referred to, forms a full and exact specification of the same, wherein we have set forth the nature and principles of our said improvements, by which our invention may be distinguished from others of a similar class, together with such parts as we claim and desire to have secured to us by Letters Patent.

The figures of the accompanying plates of drawings represent our improvements.

In plate 1, Figure 1 is a plan or top view of our machine and Fig. 2 a vertical section of the tonguing and grooving apparatus taken in the plane of the line A B, Fig. 1. In Plate 2, Fig. 3 is a longitudinal central vertical section of the machine.

We have also made an essential improvement in the tonguing and grooving apparatus, the knives for tonguing or grooving the edge of the board after it is planed, being so actuated by a peculiar arrangement of mechanical devices, as to be either fed toward or away from the edge of the board according to the varying widths of the same, while it is passing through.

a a a a in the drawings represents the framework of the machine.

b, *b* are the first set of adjustable feed rolls which feed the board on to the stationary platform *c c*.

d, *d* &c., are the cutting knives composed of curved sectional pieces bolted to a circular plate *e e* attached to the vertical shaft *f f* which is revolved by a band from the drum *g*. The plate *e e*, with its cutters, is placed horizontally over the board, and by the revolution of the said cutters the board is planed as will readily be seen by inspection of the drawings. By this arrangement of the cutters, moving in a horizontal circular path, a drawing stroke across the fibers of the wood is given to them, so that the fiber is immediately cut as soon as struck by the cutters. This prevents the tearing of the board which so often occurs in planing wet or cross grained stock, and which is occasioned by the fibers crowding together or yielding before the cutters commonly used, which do not have this peculiar drawing stroke across the board. The cutters *d*, *d* instead of being formed of sectional pieces, may simply be a circular plate or disk with one continuous cutting edge which will produce the same drawing stroke. It is desirable for the successful operation of the cutters or plate, that they be slightly concave on the underside, so that however much worn, their extreme edge only shall bear upon the board. It may be observed that this cutter composed of knives or of a circular plate revolving horizontally, may be advantageously used for cutting veneers, or, by placing it in front of the saw, for smoothing the log from which the veneer is to be cut.

We shall now proceed to describe our improvements in the tonguing and grooving apparatus, by which a board of unequal widths at its ends, or of a tapering shape, may be accurately and evenly jointed. The board after being planed on its surface as above described, is carried by a second set of feed rolls *h*, *h* over the bed *i i* to the tonguing and grooving knives, arranged in the usual manner on the periphery of revolving cylinders *k*, *l*, the shaft of the cylinder *l* being placed in a stationary rest, and the shaft *m* of the cylinder *k* having its journals in a traversing slide *n n* which is made to approach (and thus carry the knives with it) or recede from the edge of the board, during the time that it is passing through this portion of the machine, according as the board is wider at one end or the other, as follows:

Motion is communicated by means of a band from the same pulley which drives the feed rolls, to a pulley *n'*, on the same shaft with a cone or pulley *o* of varying diameters. A band *p* connects this cone *o* with a similar cone *q*, placed in an inverse position to the cone *o*, on the shaft *r r*. On the shaft *r r* is a bevel gear *s*, a groove in the journal of which fits on to a feather on the shaft *r*, so that the said gear can revolve with the shaft *r r* and also slide laterally on the same. The gear *s* engages with a similar gear *t* on the vertical shaft *u*, on the top of which is a pinion *v*, which engages with a rack *w* attached to the sliding carriage *x* and thus gives a longitudinal motion to the said car-

riage. A groove *y* in the cross bar *z* (turning on a fulcrum at *a'* on the carriage *x*) fits over a small piece or guide *b'* turning on a pivot *c'* in a connecting bar *d'* atached to the slide *n n*, before referred to. A hand screw *e'*, fastened to the carriage *x*, works into one end of the cross bar *z*, so that by turning this screw, the inclination of the cross bar *z* (turning on its fulcrum *a'*) with the carriage *x*, can be varied at pleasure. By this arrangement, as the carriage is fed along by the rack and pinion, the slide *n n* with its cutters, will, through the guide *b'* in the groove of the cross bar *z*, and the connecting bar *d'*, receive a lateral motion on its horizontal shafts *j'*, *j'*, either toward or away from the edge of the board, according to the inclination of the cross bar *z*, with the carriage *x*. As this bar *z* can be set at any angle by the screw *e'*, it will readily be seen that the slide with its cutters, can be fed up toward the edge of the board or away from it, according to the taper of the board as it passes through, by first setting the cross bar *z* accordingly, so that the board can be evenly jointed its entire length, whether its widest or narrowest end be fed through first. In case the board is of a uniform width, the cross bar *z* will be set parallel with the carriage *x*, so that the lateral or forward motion of the said carriage will convey no motion to the slide *n n*. A long screw *f' f'* passes through the piece *g'* (sliding on the shafts *j'*, *j'*) which sustains the carriage *z*, and also through the slide *n n*, so that the carriage *z* and the slide *n n*, can be moved together toward or away from the edge of the board.

In order that the carriage *z* may occupy the same time in traveling up its entire length that the board does while being fed through, and thus adapt the feed motion of the cutters to any length of board, the band *p*, before referred to, which connects the two cone pulleys *o*, *q*, may be shifted laterally on the said pulleys, by means of projections *h'*, *h'*, on a sliding bar *i' i'*, this bar *i' i'* being set in any desired position, so as to change the position of the belt *p* on the cones at pleasure, by means of an index or pointer *k'* and graduated scale *l'*. By this arrangement the speed of the cone *q* and of its shaft, which conveys motion as before described to the carriage *x*, may be regulated according to the length of the board, by simply setting the sliding bar *i' i'* (and consequently the belt *p*) in such a position as to give the carriage the necessary speed to feed up the cutters in the same time that the board occupies in passing through. After the board is thus jointed on its edges, the rack of the carriage *x* is disengaged from the pinion *v*, by lifting the carriage from the said pinion, or in any other proper manner. The carriage *x* being thus disconnected from the pinion, is retracted to its original position ready to be fed up again by a weight *m'*.

From the above description it will be seen that the cutters of the tonguing and grooving apparatus, will not only be fed toward or away from the edge of the board according to the varying widths or taper of the same, but will also occupy the same time, while being thus actuated, that the board does in traveling through the tonguing and grooving apparatus, thus adapting the feed motion of the said cutters to boards of varying widths and lengths.

Having thus described our improvements we shall state our claims as follows.—

1. We claim giving to the tonguing and grooving cutters a motion either toward or away from the edge of the board, so as to adapt them to boards of different widths or of a tapering shape, by means of the traveling carriage *x* with its adjustable cross bar *z* operating upon the guide *b*, and connecting bar *d'*, attached to the slide which carries the cutters, substantially as above described.

2. We claim giving to the traveling carriage *x* a quick or slow motion proportionate to the length of the board to be jointed, so as to convey a similar motion to the tonguing and grooving cutters, by means of the adjustable sliding bar *i'*, band *p*, and cones *o*, *q* operating together substantially as above described, and for the purpose specified.

JOHN ABSTERDAM.
WM. B. MERRILL.

Witnesses:
EZRA LINCOLN,
GEORGE LUAT.