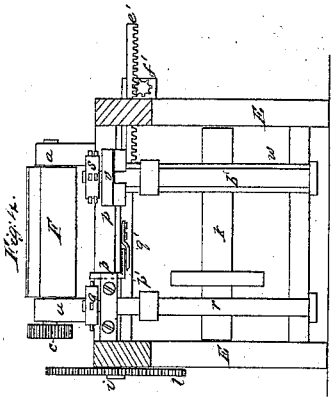
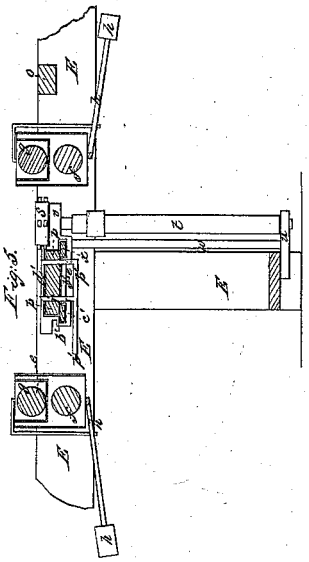
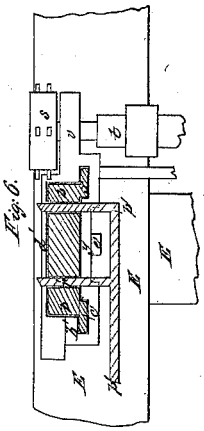
C. W. Brown,

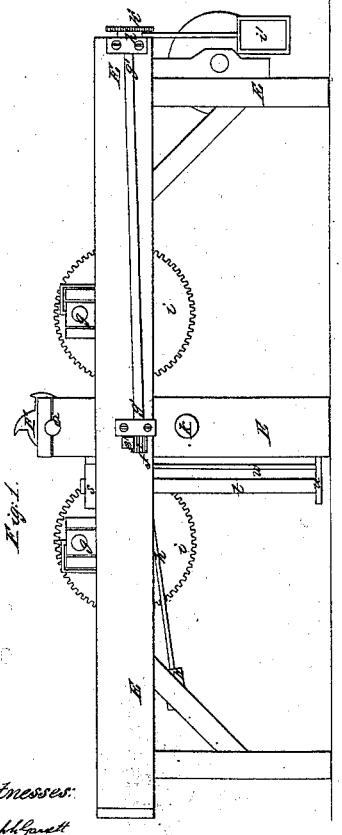
Planing and Matching Machine.

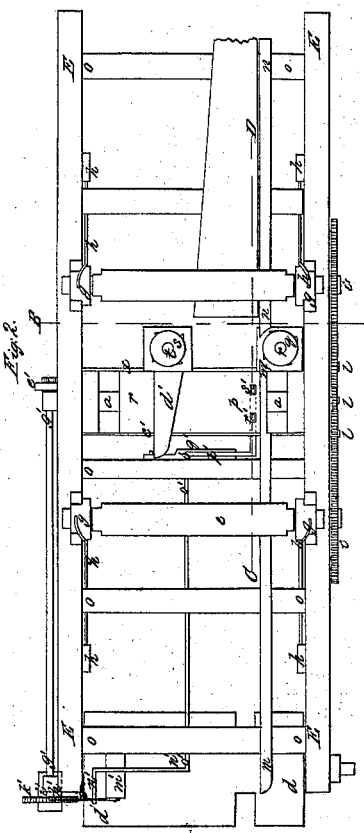
No. 3,704. Patented Aug. 14, 1844.

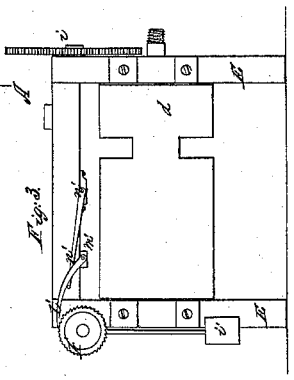












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UNITED STATES PATENT OFFICE.

CHARLES W. BROWN, OF BOSTON, MASSACHUSETTS.

TONGUING AND GROOVING MACHINE.

Specification forming part of Letters Patent No. 3,704, dated August 14, 1844; Reissued February 5, 1856, No. 349.

To all whom it may concern:

Be it known that I, CHARLES W. BROWN, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Tonguing and Grooving Apparatus of Planing-Machines, 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 I have set forth the nature and principles of my said improvement by which my invention may be distinguished from others of a similar class, together with such parts or combinations as I claim and desire to have secured to me by Letters Patent.

My improvement has for its object and purpose the tonguing and grooving of boards of various widths, and superseding the necessity of an adjustment of one of the cutting tools for each board that is to be operated upon; it is peculiarly adapted to the tonguing and grooving of boards of a tapering or irregular shape, and this constitutes the great merit of my invention, as the only requisite preparation of the board, before its introduction to the machine, is the making of one edge straight.

In the use of the machines which have heretofore been contrived for tonguing and grooving boards &c. it has been necessary, prior to passing them through the machine, to sort or arrange the boards of equal width in piles, and where the boards were of an irregular shape, to saw or reduce them to an equal or even width throughout; thus it will be readily seen necessarily involved the waste of a considerable quantity of stock, and where the boards were of different widths, required the adjustment of the movable tool for each board, whereas by my improvement in which the said tool is self adjusting both of these objectionable necessities are effectually obviated.

The figures of the accompanying plate of drawings represent my improvement.

Figure 1, is a side elevation of a planing, tonguing and grooving machine. Fig. 2, is a plan with the planing tool or cylinder removed for the better exhibition of the parts beneath the same. Fig. 3, is an end view. Fig. 4, is a transverse vertical section taken in the plane of the line A B Fig. 2 and Fig. 5, is a detail longitudinal vertical section taken in the plane of the line C D Fig. 2.

The planing machine with which I have combined my improvements and which is represented in the drawings is that familiarly known as the "Woodworth planing machine," although my said improvement, it will be seen, may be readily adapted to any of the machines in common use, without the exercise of any inventive faculty.

E E E E &c in the several drawings represent the framework of the machine, which should be constructed in the ordinary way either with wood or iron.

F is the planing cylinder the journals of which have proper bearings at *a*, *a*, the said cylinder being revolved by means of a band passing from a pulley *c* Fig. 4 on one journal of said cylinder, to the driving drum or shaft *d*, *d*, the journals of which rest and revolve in proper bearings in the framework E E E. The feed roller *e*, *f*, *e*, *f* Figs. 2 and 5 on each side of the cylinder are arranged as in the "Woodworth machines," the upper rollers *e e* serving as pressure rollers to keep the plank or board to be planed from being drawn up by the action of the knives of the planing cylinder. With this view the journals of the rollers *e*, *e*, rest and revolve in movable boxes *g*, *g*, *g*, *g*, which are pressed down by means of the weighted levers *h h*—*h h*—*h h*—*h h* arranged as shown in Fig. 2. The lower rollers *f*, *f*, are driven by means of cogged wheels *i i* (on one of their journals), which are connected to a revolving shaft *k* by means of the cogged pinions *l*, *l*, *l*, the arrangement of which will be understood by inspection of Fig. 2, the center pinion *l* of the three being on the end of the shaft *k*, said shaft being revolved by a band from the driving drum.

m m—*n n* are two longitudinal stationary guides having perfectly straight edges and fastened to the transverse bed pieces *o o*—*o o*—*o o* &c Fig. 2, placed at proper intervals from the front to rear of the machine and also to the bed piece *p p* Figs. 2, 4, 5 directly under the planing cylinder. These guides are for directing the edge of the board, which has not been made straight before its introduction to the machine, that denoted by *n n* being placed a little nearer to a center line drawn longitudinally through the machine than that at *m m*, the edges of

the two guides regulating the quantity to be cut from the edge of the board by the grooving tool to make the same straight, as in the machines in common use.

The revolving grooving tool *q*—Figs. 2 and 4 is arranged in the ordinary way on the top of a vertical shaft *r* the journals of which have stationary bearings and said shaft being revolved by a belt from the driving drum. The revolving tonguing tool *s* is also arranged on the top of a vertical shaft *t*, which shaft turns in bearings which are arranged to slide laterally as follows: The foot of the shaft *t* rests and turns in a proper step in the horizontal sliding piece *u* Figs. 1, 4 and 5, said piece being connected to the bar *y* and through the medium of said bar to the upper bearing block *v* of the shaft by the vertical bar *w*. The bearing block *v* slides laterally on the rail *x* Fig. 2, which rail *x* is in front of and attached to the bed piece *p p;* a bar *y* Fig. 5 fitted to slide underneath the bed piece *p*, *p*, extends longitudinally under the bed piece *p p* to a sliding block *b'* which moves on the rail *c'* on the front side of the bed piece *p p*. The adjustable guide bar *d'* Figs. 2, 5 of the tapering or wedging shape shown in Fig. 2, is firmly connected to the top of the movable bearing block *b* and sliding block *b'*, and this bar *d'* comes up and bears against the straight edge of the board to be planed &c., all of the parts above described as connected with the tonguing tool &c., moving together laterally, as will be readily understood without further explanation. The above described arrangement will be seen more clearly and on a larger scale in Fig. 6.

The arrangement of mechanical devices for rendering the guide bar *d'* and tonguing tool *s* adjustable is all that remains to be described of my improved apparatus; it is as follows: A rack bar *e'* is secured at one end to the bar *y*, which is connected to the guide bar *d'* as herein above set forth, the said rack bar extending through proper slots in the framework to one side of the machine as shown in Figs. 2 and 4. A cogged pinion *f'*, Figs. 1 and 4, engages with the teeth of the rack bar *e'* and is firmly fixed on one end of a long shaft *g' g'* which extends to the rear of the machine as shown in Fig. 2, having proper bearings on the side of the framework E E. On the rear end of this shaft is a pulley *h'*, Figs. 1, 2, 3, having one end of a cord or band attached to its periphery, the other end of which cord suspends a heavy weight *l'*, Figs. 1 and 3. This weight thus arranged, it will be seen, when left free to act will cause the shaft *g' g'* and pinion *f'* to turn, and move the rack bar *e'* and guide bar *d'* laterally until the inner side of the latter comes in contact with the straight edge of the board to be operated upon, against which the weight will keep it; and it will also be seen that if the board be of a tapering or wedge shape it will counteract the effect of the weight and press the guide bar *d'* outward, (if the smaller end of the board be presented first to the machine), so that the grooving wheel will work without reducing the width of the board. When the board has passed entirely by the cutter the weight &c., is prevented from pressing the guide bar *d'* farther inward by the following arrangement of machinery. A ratchet wheel *k'*, Figs. 1, 2, and 3, is arranged on the shaft *g' g'* in juxtaposition to the pulley *h'* and a pawl or series of pawls *l'* is arranged on the end of the block *m'*, the end of which pawl engages with the teeth of the ratchet wheel *k'*. The right angular arm *n' n'* on one end of the turning rod *o' o'* is arranged under the pawl *l'*. The rod *o' o'* has suitable bearings attached to the underside of the transverse bed pieces *o o—o o*— and extends along nearly to the edge of the bed piece *p p*, where it has another right-angular arm *p' p'*, shown by dotted lines in Fig. 2, which comes under the bed piece *p p* having a spring *q'*, Fig. 2, which keeps it against the underside of said bed piece, or so that it will not act to throw the pawl *l'* out of connection with the ratchet wheel *k'* unless it is pressed down by the vertical sliding bolts *r' s'*, Figs. 2 and 5. These bolts are shaped on their upper ends like the common beveled bolts of a door lock and move up and down in slots in the bed piece *p p* the bottoms resting on the top of the arm *p' p'* or connected to the same. These bolts are arranged in a line with each other and at some distance apart, the front one *s'* being as near as it can be to a line drawn through the points where the tonguing and grooving tools would strike the edges of the board, the object of which arrangement is as follows: When the front end of the board comes in contact with the first bolt *r'* it depresses it and consequently turns the rod *o' o'*, throws the pawl *l'* out of connection with the ratchet wheel *k'* and allows the weight *i'* to act as hereinabove set forth and carry the guide bar *d'* against the edge of the board or plank. The underside of the board, it will be seen, as it passes over the bolts *r' s'* keeps them down and keeps the pawl *l'* out of connection with the ratchet wheel *k'*, leaving the guide bar *d'* and tonguing tool *s* free to move as the edge of the board may press them until the rear of the board escapes from the front bolt *s'*, when the pawl is left free to engage with the teeth of the wheel. The necessity of the second bolt will be apparent when it is stated that if there were but one bolt when the end of the board left it, after passing in the direction indicated by the red arrows in Fig. 2, that portion of the board which remained to be grooved &c., would, if it were tapering, be

cut or torn at the angular part, as it is requisite that the first bolt r' should be placed at some distance in rear of the tonguing tool in order to give the guide bar d' time to advance to the edge of the board, after the pawl l' has been thrown out from the ratchet wheel k', before the said tool begins to act. It will be evident that either the tonguing or grooving tool may be made adjustable as above described.

Having thus set forth and described my improvement I shall state my claim as follows:

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

1. Making either the tonguing or grooving tool self-adjusting by arranging the box or bearing of the shaft of either of the said tools, so as to slide laterally on a rail, and connecting said box or bearing to a sliding guide bar d', which bar is governed or regulated in its movements by the edge of the board, and kept up against said edge by means of a weight operating on it (so as to press it laterally) through the medium of a rack and pinion as herein before set forth, the mechanical arrangement and operation being substantially as herein above specified.

2. I also claim—the combination of the sliding bolts r', s', with the turning rod o' o' (having right angular arms n' n'—p' p'), and pawl l' and ratchet wheel k' on the end of the shaft which the weight i' turns or revolves, said combination being arranged substantially as hereinbefore set forth and for the purpose of permitting or checking the operation of said weight i' upon the sliding guide bar d' as hereinbefore specified.

In testimony that the foregoing is a true description of my said invention and improvement I have hereto set my signature this twenty-ninth day of July in the year eighteen hundred and forty-four.

CHARLES W. BROWN.

Witnesses:
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Fras. J. Humphrey.

[First Printed 1913.]