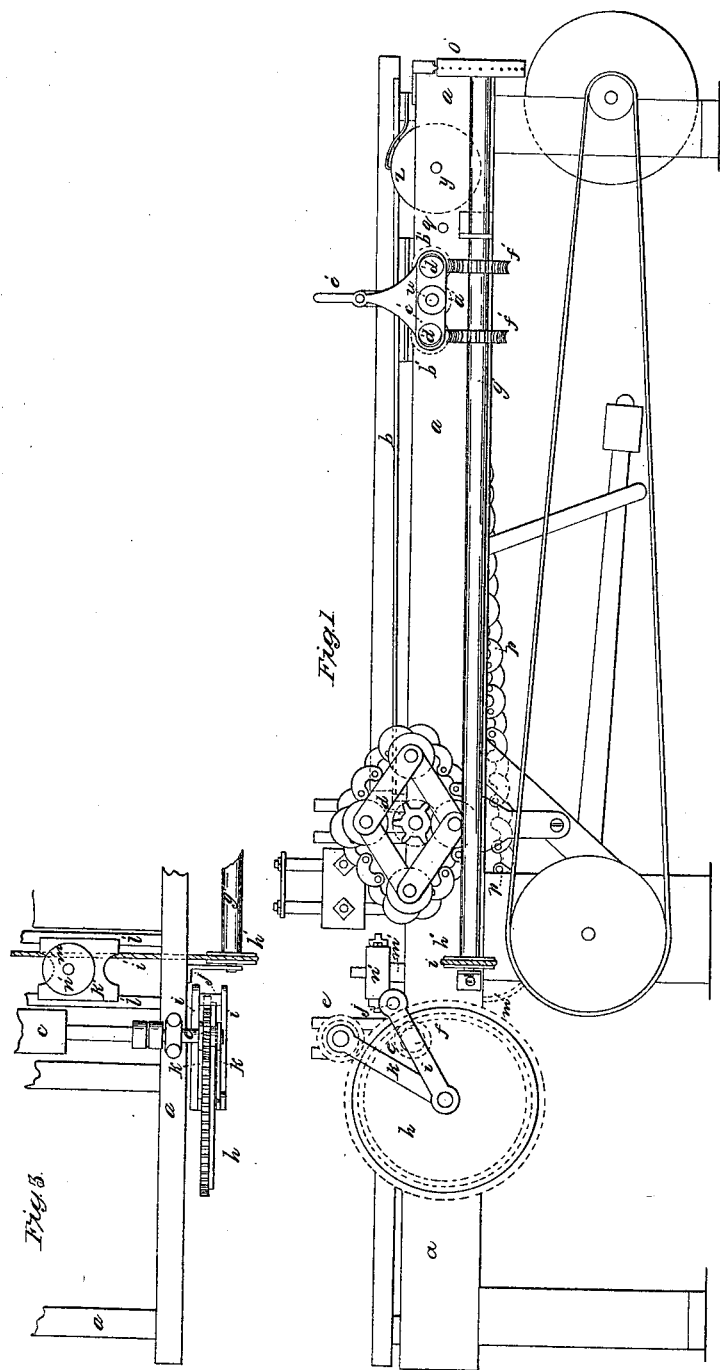


*W. E. Cornell,*  
*Wood Planing Machine.*

*No 7,868.*

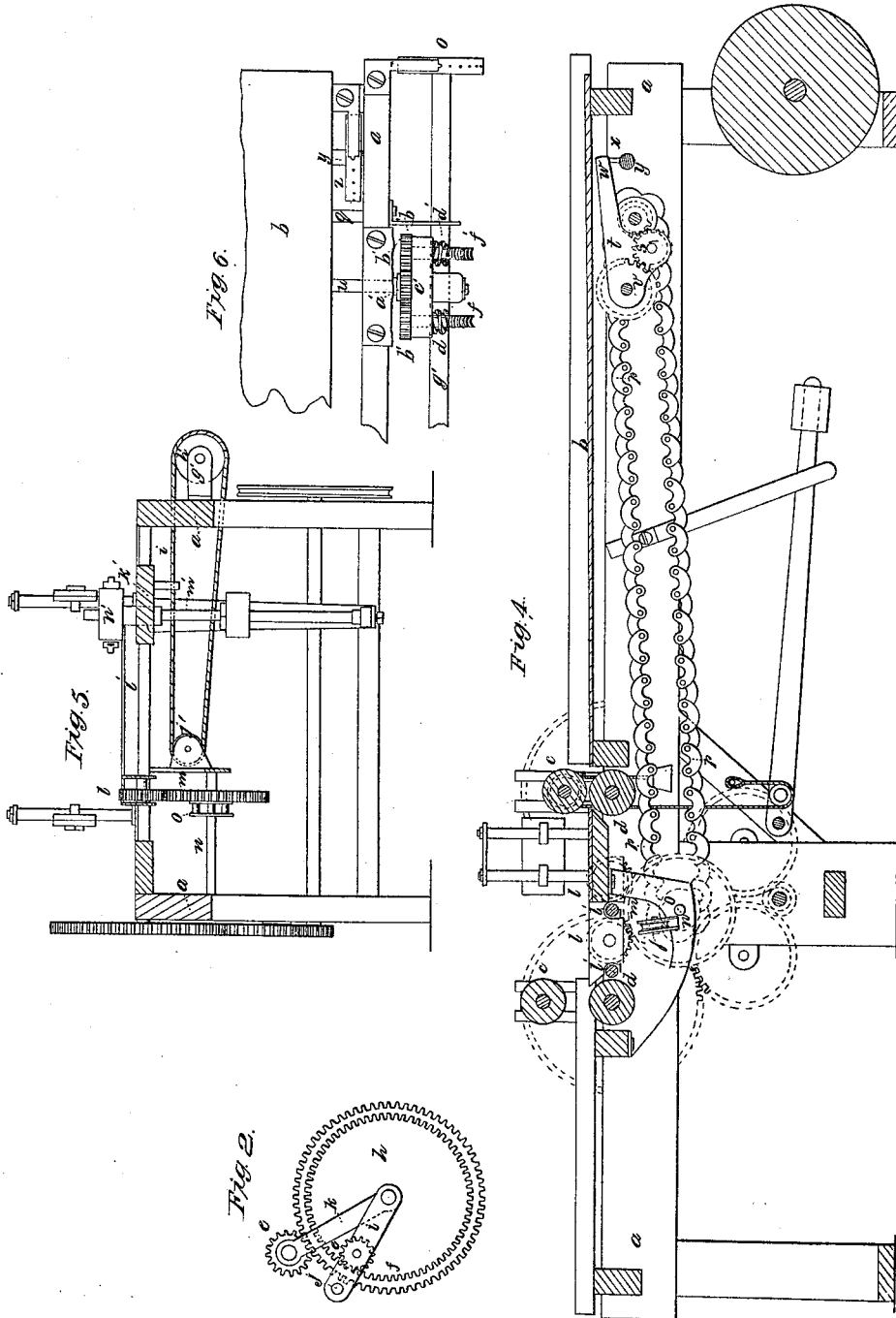
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# UNITED STATES PATENT OFFICE.

WILLIAM E. CORNELL, OF BOSTON, MASSACHUSETTS.

## PLANING-MACHINE FOR DRESSING THE EDGES OF BOARDS.

Specification of Letters Patent No. 7,868, dated January 1, 1851.

*To all whom it may concern:*

Be it known that I, WM. E. CORNELL, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Machines for Planing and Edging or Jointing or Tonguing and Grooving Planks or Boards of a Tapering Form in Breadth, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation of the machine; Fig. 2, a section representing the mode of gearing the feed rollers; Fig. 3 a plan of the same; Fig. 4, a longitudinal vertical section; Fig. 5, a cross vertical section, and Fig. 6 a plan view of the reversing motion.

The same letters indicate like parts in all the figures.

The first part relates to the method of gearing the top and bottom feed rollers so that they shall move together and remain in gear to whatever extent they may be separated by varying thicknesses of planks and this part of my invention consists in communicating motion from one roller to the other by means of a cog pinion on the arbor of each connected by a cog wheel with an outer and inner range of cogs, the inner range engaging the cogs of the pinion on the arbor of the lower roller, and the outer range engaging the cogs of the pinion on the arbor of the upper roller; the arbor of the cog wheel being hung connected by a link or links with the arbor of the lower roller, and by another link or links with the arbor of the upper roller, so that as the rollers are drawn nearer together or separated, the cog wheel will by reason of these links vibrate between the two pinions and remain in gear with them.

The second part of my invention relates to the method of operating one of the cutter wheels for either edging or tonguing or grooving the tapering edge of planks, and this part of my invention consists in operating the machinery which causes the cutter wheel gradually to approach toward or recede from the line of motion of the plank by the passage of the plank over and in contact with one or more cog or spur wheels, so that this motion shall be received from

and correspond with the motion of the plank, and this part of my invention also consists in interposing at some point in the gearing between the wheel or wheels operated by the plank and the sliding frame or carriage which carries the cutter wheel, a reversing gear for the purpose of setting the machine to work from the narrow toward the wide end or from the wide toward the narrow end, and if suspended will edge the plank parallel to the other edge.

In the accompanying drawings (*a*) represents the frame of a planing machine such as are in general use. The planing part is omitted as it makes no part of my invention.

The plank to be planed passes as usual over the bed (*b*) and between pairs of feed rollers (*c, d*), and (*c, d*), the lower rollers of each pair running in fixed bearings and the upper ones in sliding boxes to be borne down by weighted levers or other analogous means in the usual manner that it may adapt itself to the varying thickness of planks.

The two rear rollers have each a pinion (*e*) on one end of their arbors outside the frame. The pinion of the lower or permanent roller engages a range of cogs (*f*), made on the inner periphery of a ring (*g*) attached to the inner face of a wheel (*h*), which has its bearings in one end of two links (*i, i*), connected together at their other end by a brace bolt (*j*), and the inner one of these two links is hung and is free to vibrate on the arbor of the lower roller, so that however the wheel (*h*), with its ring of cogs may vibrate the inner range of cogs will always engage the pinion on the lower roller. The ring (*g*), has another range of cogs on its outer periphery which engage the cogs of the pinion on the upper roller, and to keep these also in gear the arbors of the two are connected together by two links (*k, k*) which admit of any extent of vibration without any change in the distance of their axes. In this way it will be seen that however the two rollers may separate from and approach toward each other the cogs will always be at their proper pitch line.

In appropriate recesses in the bed (*b*) of the machine there are two spur wheels (*l, l*), properly hung on journals so that

their cogs project sufficiently above the upper surface of the bed to be acted upon and turned by the motions of the plank when pressed down and carried through the machine. These two wheels engage a cog wheel (*m*) that turns on a stud pin (*n*) and which carries a spur wheel (*o*) around which passes a chain (*p*.) extending to and passing around a corresponding wheel on a shaft (*q*.) which carries a pinion (*r*.) This pinion engages another pinion (*s*) hung in a lever (*t*) which turns on a shaft (*u*) as a fulcrum and this shaft also carries a cog wheel (*v*) which derives motion from the pinion (*s*.) The lever (*t*) has an arm (*w*) which when held up by a spur (*x*) on a shaft (*y*) throws up the pinion (*s*) to put it in gear with the pinion (*r*), and when the spur is down throws them out of gear, so that by the turning of the shaft which carries the spur the mechanism can be thrown in and out of gear. The shaft (*y*.) for this purpose carries an index wheel (*z*) to enable the attendant to do this. The shaft (*u*) of the wheel (*v*) passes through to the outside of the frame and there carries a pinion (*a'*) which engages two other pinions (*b' b'*) of the same diameter with their arbors fitted to turn in the ends of a rocking lever (*c'*) which rocks on the end of the shaft (*u*), so that in whatever position this lever may be the two pinions (*b' b'*) will always be turned in the same direction by the shaft.

The arbor of each of the pinions (*b' b'*) carries a worm or screw (*d'*) one with a right and the other with a left handed thread, so that by means of a hand lever (*e'*) the rocking lever (*c'*) can be shifted to engage either of the two worms (*d'*) with one of two cog-wheels (*f' f'*) on a line shaft (*g'*) which at one end carries a band wheel (*h'*) around which passes a band or chain (*i'*) which in turn passes around a pulley (*j'*) near the other side of the frame. This band or chain is attached to a frame or carriage (*k'*) which slides in appropriate ways (*l' l'*) arranged transversely across the frame, and in which is hung the shaft (*m'*) of the cutter wheel (*n'*) which may be of any desired construction for working on the edge of the plank, either to face, tongue, groove or mold it as may be necessary. When the rocking lever is in a horizontal position, neither of the worms are in gear with the cog-wheels (*f' f'*) so that no motion will then be communicated to the sliding carriage of the cutter wheel and its position may then be adjusted by hand to the breadth of board by an index wheel (*o'*) on the outer end of the line shaft (*g'*).

When the position of the cutter wheel is determined, the attendant puts in gear one of the worms with its appropriate cog

wheel on the line shaft and also turns up the spur to put in gear the pinions (*s, r*.) and wheel (*v*) and as the plank passes over the spur wheels (*l, l*.) turning them, they communicate the requisite motion to the carriage of the cutter wheel by the connections described to cause it (the cutter wheel) gradually to approach the line of motion of the plank to taper that edge of the plank on which it acts; but if the plank be put in with the narrowest end foremost, then the attendant must reverse the motion of the gearing by shifting the rock lever to put in gear the other worm with its corresponding cog wheel, which will cause the cutter wheel gradually to recede from the line of motion of the plank and if it be desired to edge the plank partly tapering and partly parallel, the attendant can effect this by having the machinery all in gear during the time the tapering part is passing and then disconnecting the machinery either by turning down the spur (*x*) which will break the connection between the pinions (*r, s*.) or by turning the rocking lever (*c'*) in a horizontal position which disconnects the two worms from the wheels on the line shaft and then the cutter wheel will continue in the same position and edge the rest of the plank in a line parallel with its line of motion.

It will be obvious to the mechanician that instead of communicating the sliding motion to the cutter wheel carriage by means of a band or chain, this may be done by other equivalent mechanical means such as a rack and pinion or a cam and counter weight or spring, and it will also be evident that various changes within the range of my invention may be made in the connecting mechanism for communicating the required motions from the spur wheels acted upon by the plank and the cutter wheel carriage. I do not wish therefore to be understood as confining myself to the precise arrangement of parts herein specified, but to claim the principle irrespective of the special arrangement of parts for carrying that principle into operation.

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

1. The method substantially as described of communicating motion from the bottom to the top roller by the two pinions combined with the wheel having the inner and outer rim of cogs, by means of the joint links substantially as described and for the purpose specified.

2. I also claim operating the machinery for carrying the cutter wheel toward or from the line of motion of the plank by the passage of the plank over and in contact with a spur wheel or wheels, substantially as described, whereby the motion of the cutter wheel for edging tapering planks

will be made to correspond with the motion of the plank itself as described.

3. I also claim interposing between the wheel or wheels actuated by the plank and  
5 the carriage of the cutter wheel, a reversing motion substantially as described, by means of which the machine can be made to act on the plank from the narrow toward the wide

end, or vice versa, or by suspending its operation edge the plank with parallel sides 10 as described.

WILLIAM E. CORNELL.

In presence of—

RICHD. H. DANA, Jr.,  
T. W. BAXTER.