Cornelius Brown,

Wood Plane Attachment.

No. 5,191. Patented July 17, 1847.

Fig. 3.

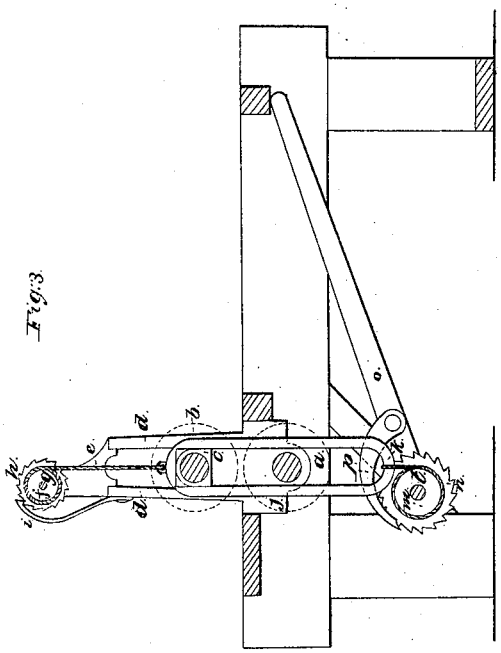


Fig. 2.

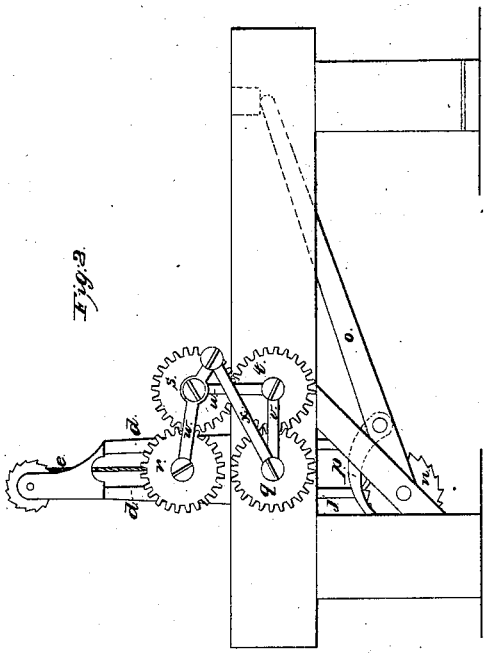


Fig. 4.

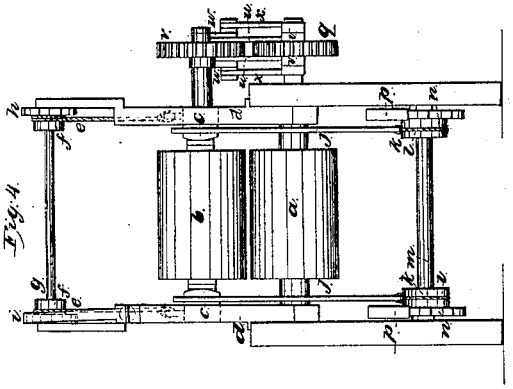
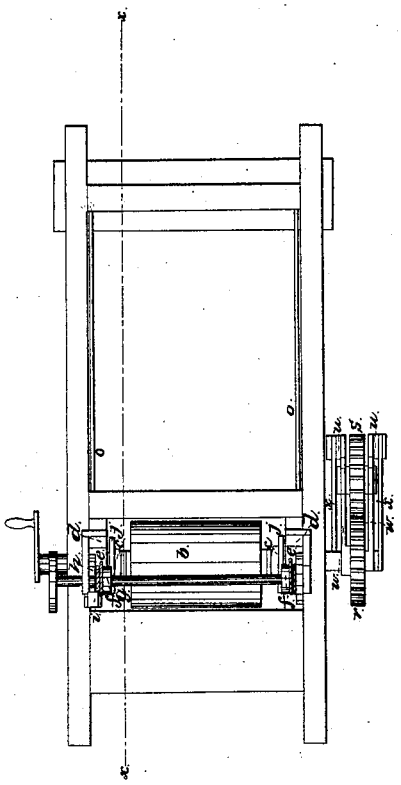


Fig. 1.



UNITED STATES PATENT OFFICE.

C. W. BROWN AND W. E. CORNELL, OF BOSTON, MASSACHUSETTS.

GEARING FOR CONNECTING FEED OR PRESSURE ROLLERS.

Specification of Letters Patent No. 5,191, dated July 17, 1847.

To all whom it may concern:

Be it known that we, CHARLES W. BROWN and WILLIAM E. CORNELL, of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in the Method of Arranging and Operating Feed and Pressure Rollers of Planing-Machines, which improvements are applicable to other purposes, and that the following is a full, clear, and exact description of the principle or character which distinguishes them 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 plan; Fig. 2, a longitudinal elevation; and Fig. 3 a longitudinal section taken at the line (X X) of Fig. 1, and Fig. 4 a cross vertical section.

The same letters indicate like parts in all the figures.

In planing machines the boards to be planed are moved forward to the rotating plane by means of two rollers, the lower one turning in permanent, and the upper one in sliding boxes connected with springs or weighted levers to make pressure on the board as it is moved forward, the lower roller receiving motion from some part of the mechanism, and imparting it in a reversed direction to the upper one by means of two wheels the cogs of which are made of considerable length that the upper roller may move up and down to accommodate itself to the unequal thickness of the board or boards which are to pass between them; but when it is necessary to adapt these to a great variety of thicknesses, then it becomes necessary to remove the wheels and substitute others of greater or less diameter; an operation which is attended with much trouble and waste of time.

The object of the first part of my invention is to avoid this difficulty, which I effect by making the wheels, attached to the arbors of the two rollers, so small that their cogs shall not engage or mash into each other, and communicate the motion from the one to the other by means of two auxiliary cog wheels, the arbors of which turn in links that keep them together in the proper pitch, the lower one being in like manner linked with the arbor of the lower roller, and the upper one with the wheel of the upper roller,—the four wheels being in succession linked with one another by a series of links that keep their cogs at the proper pitch, it will be obvious that the distance between the two rollers may be varied to the extent of the length of all the links, and still any motion given to one of the rollers will be imparted to the other, and in a reveresd direction, each of the auxiliary wheels vibrating around and at the same distance from the axis of the roller with which it is linked. And for the purpose of sustaining the auxiliary wheels and the links that connect them with the arbors of the rollers, one set of links extending from one of the rollers to one of the auxiliary wheels, is made to extend to a short distance beyond the axis of the auxiliary wheel, and this extension is then connected by another set of links with the arbor of the other roller. And the second part of my invention relates to the manner of connecting the weighted levers with the movable boxes of the upper roller that the range of ratch or distance between the two rollers may be varied to an extent beyond the range of vibration of the weighted levers: which object I attain by connecting the movable boxes by means of links, chains, or other analogous device, with a windlass shaft provided with ratchet wheels, the weighted levers being provided with pointed catches or pawls that take into them, so that by disengaging the catches or pawls from the teeth of the ratchet wheels the shaft will be free to turn and permit the upper roller to be elevated to the height required, and then by reëngaging the catches the weighted levers may again bear down the roller.

In the accompanying drawings (*a*) represents the lower roller which runs in permanent boxes and which may receive motion in any desired manner, and (*b*) is the upper roller, the journals of which run in boxes (*c*, *c*) that slide in ways (*d*, *d*). These boxes are suspended by cords or chains (*e*, *e*) that are attached to and wind on drums (*f*, *f*) on the arbor (*g*) provided with a ratchet wheel (*h*) so that by means of a spring pawl or catch (*i*) it can be held at any point desired. These cords or chains will hold the roller at any height required, but will admit of its free movement upward, so that this is used simply as a means of setting the roller to any thickness of board desired, and yet give it the required play up and down. From each of the sliding

boxes there is a link (*j*) extending downward and provided at the lower end with a cord or chain (*k*) attached to, and wound around a drum (*l*) near each end of an arbor (*m*), which is also provided at each end with a ratchet wheel (*n*). The weighted or spring levers (*o*, *o*), are each provided with a hand or catch (*p*,) which takes into the teeth of the ratchet wheels, so that by working the levers the arbor (*m*) can be turned to wind the cords on the drums (*l*, *l*) and draw down the roller to make pressure on the board passing between the two. When it is desired to raise the upper roller higher than the play of the levers will admit, it is only necessary to throw up the hands or catches (*p*, *p*) and turn the arbor (*g*) at top.

Instead of the cords or chains (*k*, *k*,) that connect the links (*j*, *j*) with the drums (*l*, *l*) racks and pinions may be substituted, but we deem chains the best.

On the end of the arbor of the roller (*a*) there is a cog wheel (*q*) and another (*r*) of similar size on the arbor of the upper roller. Two auxiliary cog wheels (*s*) and (*t*) are connected with each other at the proper pitch by means of two links (*u*, *u*) in which the axles of the wheels turn freely. The lower one of these wheels is in like manner connected, at the proper pitch, with the wheel (*q*) by means of two links (*v*, *v*), and the upper one is also, and in like manner connected with the wheel (*r*) of the upper roller by links (*w*, *w*). Each set of links being equal to the semi-diameter of the pitch line of the two wheels which they connect together, it will be obvious that one of the wheels may move around the other, and still have the cogs mash properly, so that the upper roller can be moved up and down at pleasure and yet retain the train of wheels in such relation with each other that any motion given to one of the rollers will be transmitted through the train to the other roller which will thus be turned in the opposite direction to coöperate in moving forward the board between them. But it is necessary to sustain the auxiliary wheels in their proper position or else they would be carried down by their weight until one of them would engage with the wheels on the two rollers at the same time, which would of course break the cogs or stop the train. To avoid this the links (*w*, *w*) are extended for a short distance beyond the axis of the auxiliary wheel (*s*), and are there connected with the arbor of the roller (*a*) by means of two links (*x*, *x*); and the sum of the length of the projection of the links (*w*, *w*) beyond the axis of the wheel (*t*) and the length of the links (*x*, *x*), should be equal to the sum of the length of the links that unite the three wheels (*q*,) (*s*) and (*t*), or nearly so. The links (*x*, *x*) being longer than either of those that connect the wheels, they will always form an angle with the line of the others, and therefore by their connections with the projections of the links (*w*, *w*), must hold the auxiliary wheels in their proper position relatively to those on the rollers.

It will be obvious from the foregoing that these improvements are applicable to other purposes as well as planing machines, as for instance to the feed and other rollers of all machines in which the distance between the two rollers has to be varied,—as for example to the feed rollers of straw cutters which move the grain forward to the knife, and which should be adapted to a heavy or light charge of straw. The objects to which these improvements are applicable are so numerous that it is deemed unnecessary to enumerate them.

What we claim therefore as our invention and desire to secure by Letters Patent, is—

The method of communicating rotary motion, in the reverse direction, from one roller, arbor, or shaft to another by means of two auxiliary wheels whose axes are independent of the frame so connected with each other and with the wheels on the axles of the rollers, &c., by jointed links as to admit of varying the distance between the two rollers, arbor, or shafts, at pleasure, substantially as described, and in combination with this we also claim the diagonal link or links for retaining the auxiliary wheels in their proper position relatively to the wheels on the axles of the rollers.

CHARLES W. BROWN.
WILLIAM E. CORNELL.

Witnesses:
GARDINER G. HUBBARD,
WILLIAM A. SWIFT.