(Model.)

C. A. JUENGST.

SHAPING AND SLOTTING MACHINE.

No. 436,139. Patented Sept. 9, 1890.

Fig. 1.

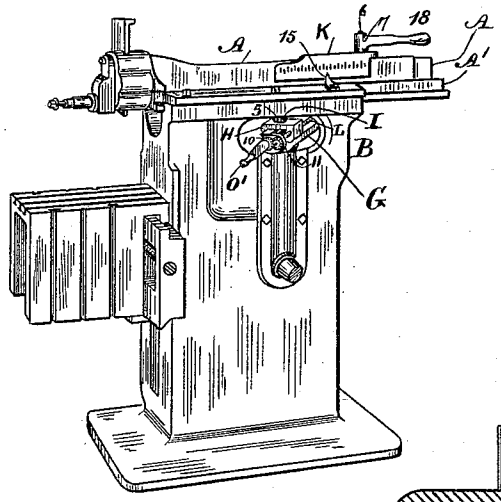


Fig. 4.

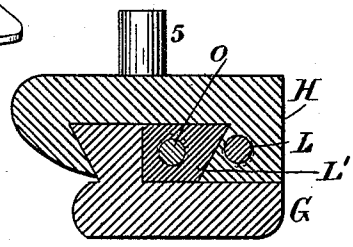


Fig. 5.

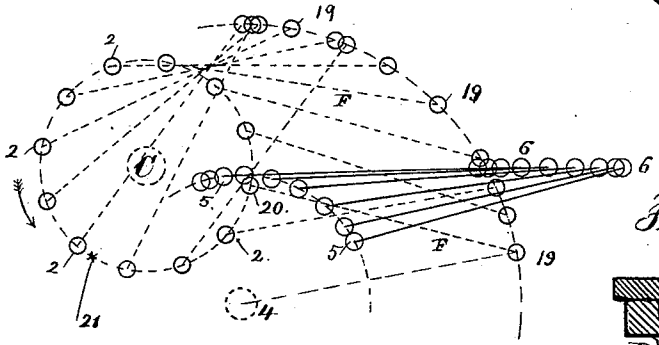


Fig. 2.

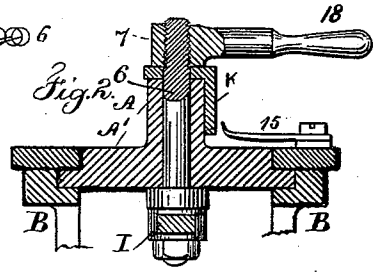
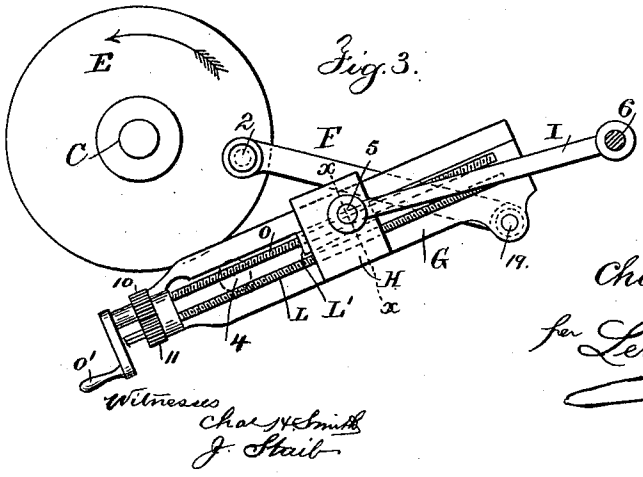


Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES A. JUENGST, OF CROTON FALLS, NEW YORK.

SHAPING AND SLOTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 436,139, dated September 9, 1890.

Application filed December 2, 1889. Serial No. 332,211. (Model.)

To all whom it may concern:

Be it known that I, CHARLES A. JUENGST, a citizen of the United States, residing at Croton Falls, in the county of Westchester, in the State of New York, have invented an Improvement in Shaping and Slotting Machines, of which the following is a specification.

Machines have heretofore been made in which the cutter-bar is reciprocated by the action of a crank and connecting-rod; but the tool is much more rapid in one part of its movement than the other, and difficulty has also been experienced in regulating the length of the motion to be given to the tool while the machine is running.

My present improvement is designed for giving to the tool a nearly-uniform speed of movement while the planing and slotting operation is being performed and a rapid motion upon the return movement of the tool, and I also provide for regulating the extent of motion given to the cutter-bar during the movement of the parts.

In the drawings, Figure 1 is a perspective view representing a slotting-machine to which my improvements are applied. Fig. 2 is a sectional view of the cutter-bar and bed. Fig. 3 is a detached view of the twin screws, saddle, and connections. Fig. 4 is a section in larger size at the line *x x* of Fig. 3, and Fig. 5 is a diagram illustrating the movements of the respective parts.

The cutter-bar A is of any desired character, and the base A′ of such cutter-bar is adapted to slide longitudinally in the stationary head-block B, and these parts may be either horizontal or vertical. I have represented them in Fig. 1 as horizontal, in which case the main driving-shaft C occupies a vertical position, and under all circumstances it is perpendicular, or nearly so, to the cutter-bar, and it receives its motion from any suitable driving-power, and upon this shaft C is a disk E, having a pin 2 and link F to the pivoted saddle-lever G, the link being pivoted to the saddle at 19. This lever G is pivoted upon a stud or gudgeon 4, perpendicular to the cutter-bar, so that this saddle-lever is rocked or swung by the action of the crank-disk E and link F, and upon this lever G is a saddle H, that is capable of being moved endwise upon such saddle-lever, and there is a connecting-rod I passing from the pivot 5 upon the saddle to the pivot 6, that is formed by the bolt passing through the slot in the cutter-bar and having a nut 7, with a lever-handle 18, for clamping the bolt to the cutter-bar; and this cutter-bar is slotted longitudinally, as usual, so that the cutter may be brought to the desired point for acting upon the article that is being planed or slotted, and this clamping-bolt 6 passes through a hole in the flanged clamp-plate K, that sets over the slotted rib of the cutter-bar, and by the friction between this clamp-plate and the cutter-bar under the action of the bolt 6 and nut 7 a very firm and reliable connection is made between such bolt 6 and the slotted cutter-bar, in order that the position of the bolt 6 to the cutter-bar may not vary while in operation.

In the pivoted saddle-bar G there are twin screws L O, preferably right and left handed, and upon the end of the screw O is a crank-handle O′, by which it may be rotated, and there is a pinion 10, fixed on the arbor of the screw near such handle, and the arbor of the screw L projects beyond the end of the pivoted saddle-lever and is provided with a sliding pinion 11 upon a feather or key, and the parts are constructed, as indicated in Fig. 3, so that the pinion 11 may be slipped endwise into gear with the pinion 10 or out of gear with the same. At the under side the saddle H projects downwardly to form a nut, through which the screw L passes, as seen in Fig. 4, and the side of this nut portion is beveled, so that a wedge L′ may pass in between such nut and the inner edge of the pivoted saddle-lever G, and the screw O passes through this wedge, the wedge being screw-threaded to form a nut. It is now to be understood that when the handle O′ is rotated and the screw O revolved the wedge L′ is sufficiently withdrawn to loosen the saddle, the pinion 11 is then slipped along into gear with the pinion 10, and both screws L and O can be rotated in either direction and the saddle moved freely one way or the other, after which the pinion 11 is slipped endwise and out of gear with the pinion 10 and the handle O′ rotated sufficiently

to force the wedge L′ back into its place to clamp the saddle H firmly to the pivoted saddle-lever G.

Upon reference to Figs. 3 and 5 it will be apparent that the link F gives to the saddle-lever G a uniform swinging movement upon its stud or gudgeon 4, and that if the saddle H is moved by the twin screws until the pivot 5 of the connecting-rod I comes over the pivot 4 no endwise movement will be given to the cutter-bar. If, on the other hand, the twin screws are rotated until the saddle H is moved to the extreme end of the pivoted saddle-lever G, the maximum movement will be given to the slotted cutter-bar. By making the clamping-plate K of sufficient length and dividing its lower face into feet and inches or other measurements and providing an index 15 upon the stationary head-block B the extent of motion given to the slotted cutter-bar can be indicated with facility, and by loosening the nut 7 the slotted cutter-bar can be moved endwise in either direction to bring the tool to the proper place for acting upon the article that is being planed or shaped, and, furthermore, as the handle O′ is near the pivot 4 of the saddle-lever G, the handle O′ receives but little vibrating movement as such saddle-lever is swung by the link F. Hence the handle O′ can be rotated with facility while the parts are in motion, so as to vary the throw or movement given to the cutter, as may become necessary, and the saddle can also be released or clamped firmly without having to stop the machine.

Upon reference to Fig. 5 it will be seen that a differential crank motion is obtained for swinging the pivoted saddle-lever, and this differential crank movement causes the bolt 6 of the cutter-bar to move with nearly uniform velocity while the tool is in operation, and the return motion is very rapid.

By the diagram Fig. 5 it will be apparent that when the parts are in position corresponding to those represented in Fig. 3 the crank-pin 2 starts from the position 20, and as such crank-pin passes through the twelve equidistant positions indicated the link F will assume the respective positions indicated by the dotted lines drawn from the respective points 2, which are thirty degrees apart, and the forward motion of the tool will be given while the crank-pin 2 describes the arc of a circle of about two hundred and fifty degrees, and the distances apart of the positions of the bolts 6 are approximately equal, as represented in the diagram. Of course the movements are slower toward the two ends, but the return motion of the tool will take place while the crank-pin 2 is moving through an arc of about one hundred and ten degrees—that is to say, during the movement between the point 21 and the starting-point 20. Hence this differential crank movement not only equalizes the power as applied to the tool, but it lessens the strain upon the machine by unifying the motion, and when the tool is returned and requires but little power to move it the motion given to the cutter-bar is correspondingly accelerated.

The disk E is the well-known equivalent of a crank, the pin 2 performing the same functions as a crank-pin.

It is to be understood that my improvements are available with any ordinary shaping-machine that works either horizontally or vertically, and also in machines for cutting mortises or slots, the parts being constructed so as to receive the pivoted saddle-bar, saddle, and the respective connections from the same to the crank-pin of the main shaft and to the cutter-bar.

I claim as my invention—

1. The combination, with the main shaft and cutter-bar, of a disk or its equivalent, a pin and link receiving motion from the main shaft, a pivoted saddle-lever swung by the link, an adjustable saddle, and a connecting-rod from the same to the slotted cutter-bar, substantially as set forth.

2. The pivoted saddle-bar and saddle, in combination with the twin screws, the wedge-shaped nut moved by one of the screws, the saddle-bar being moved by the other screw, and pinions for connecting the two screws, substantially as set forth.

3. The combination, with the pivoted saddle-lever, the saddle upon the same, and the connecting-rod and cutter-bar, of twin screws passing longitudinally through the pivoted saddle-lever, one of which screws gives motion to the saddle, the clamp-wedge receiving motion from the other screw, and mechanism for rotating said screws, substantially as set forth.

4. The combination, with the pivoted saddle-lever and the saddle, of twin screws, one of which gives motion to the saddle, the clamping-wedge receiving motion from the other screw, a crank-handle for rotating the screw that moves the clamping-wedge, pinions for gearing the twin screws together, and means for disconnecting such pinions to allow for the movement of the clamping-wedge after the saddle has been adjusted, substantially as set forth.

5. The combination, with the reciprocating cutter-bar and the main driving-shaft, of a disk or its equivalent and pin rotated by the main driving-shaft, a swinging lever pivoted near one end, a connection from the lever to the cutter-bar, and a link from the disk-pin to the swinging end of the pivoted lever, substantially as specified, whereby the movement of the cutter while in action is gradual and nearly uniform and the return movement is rapid, substantially as set forth.

6. The combination, with the main shaft, disk, pin, and link, of a saddle-lever pivoted near one end and to which the link is connected, a saddle upon the lever, a connecting-rod, slotted cutter-bar and bolt connecting the

cutter-bar and connecting-rod, and a screw for adjusting the saddle, the handle of the screw being near the pivot of the saddle-lever, so as to be adapted for use while the parts are in motion, substantially as set forth.

7. The combination, with the slotted cutter-bar, the connecting-rod, and the differential crank-movement, of a clamping-plate through which the bolt 6 of the connecting-rod passes, such clamping-plate having a flange adjacent to the stationary head of the cutter-bar, and an index upon such stationary head and divisions upon the clamping-plate for indicating the distance that the cutter-bar is reciprocated, substantially as set forth.

Signed by me this 25th day of November, 1889.

CHAS. A. JUENGST.

Witnesses:
GEO. T. PINCKNEY,
WILLIAM G. MOTT.