No. 608,484. Patented Aug. 2, 1898.

C. SEYMOUR.

PUNCHING MACHINE.

(Application filed Dec. 3, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

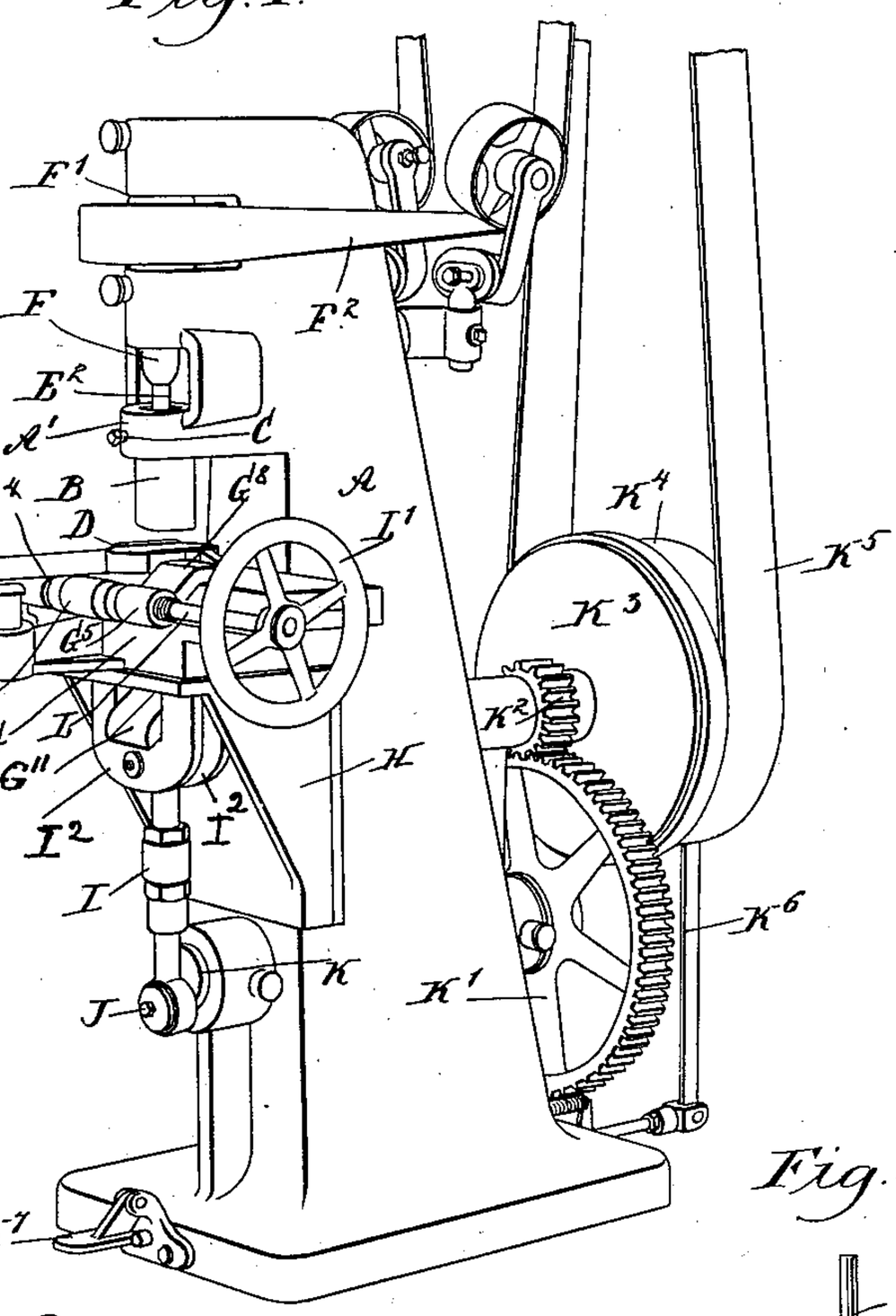


Fig. 2.

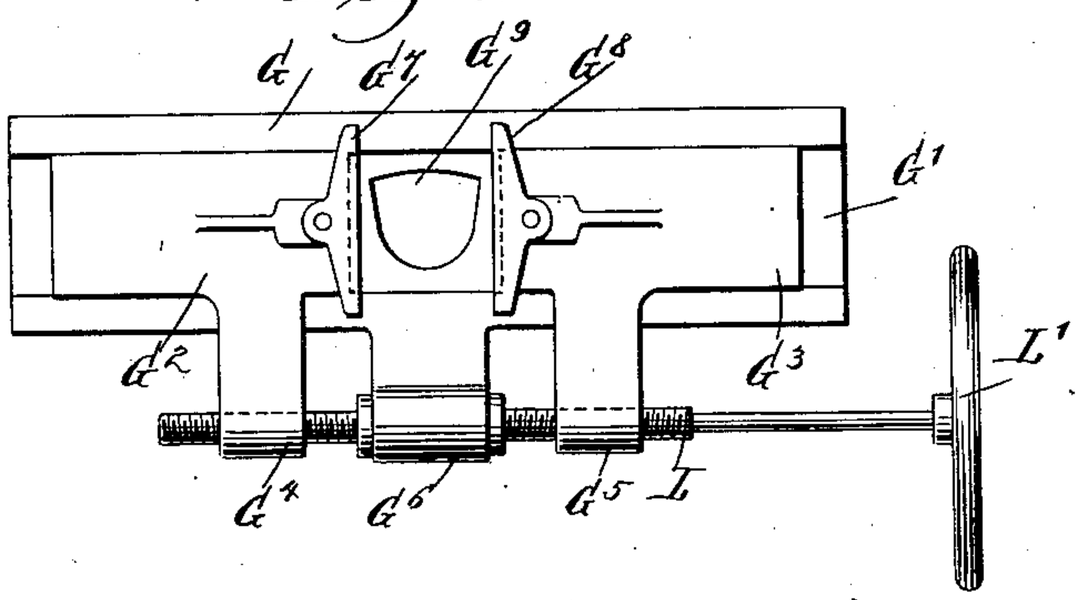


Fig. 3.

Fig. 4.

Fig. 5.

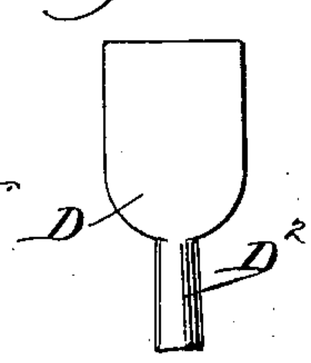
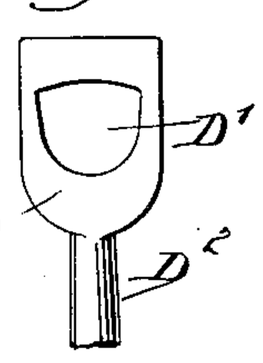


Fig. 6.



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(No Model.) 2 Sheets—Sheet 2.

Fig. 8,

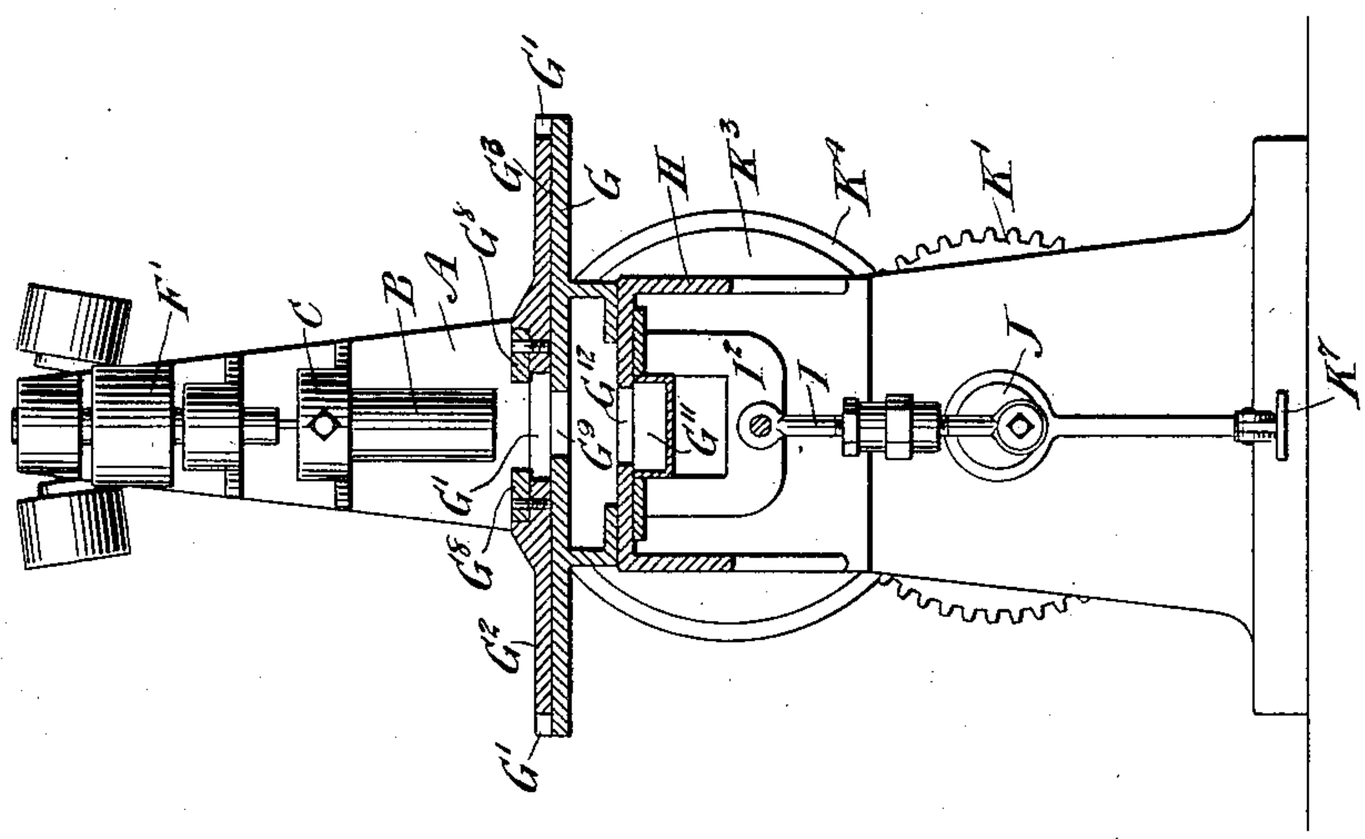
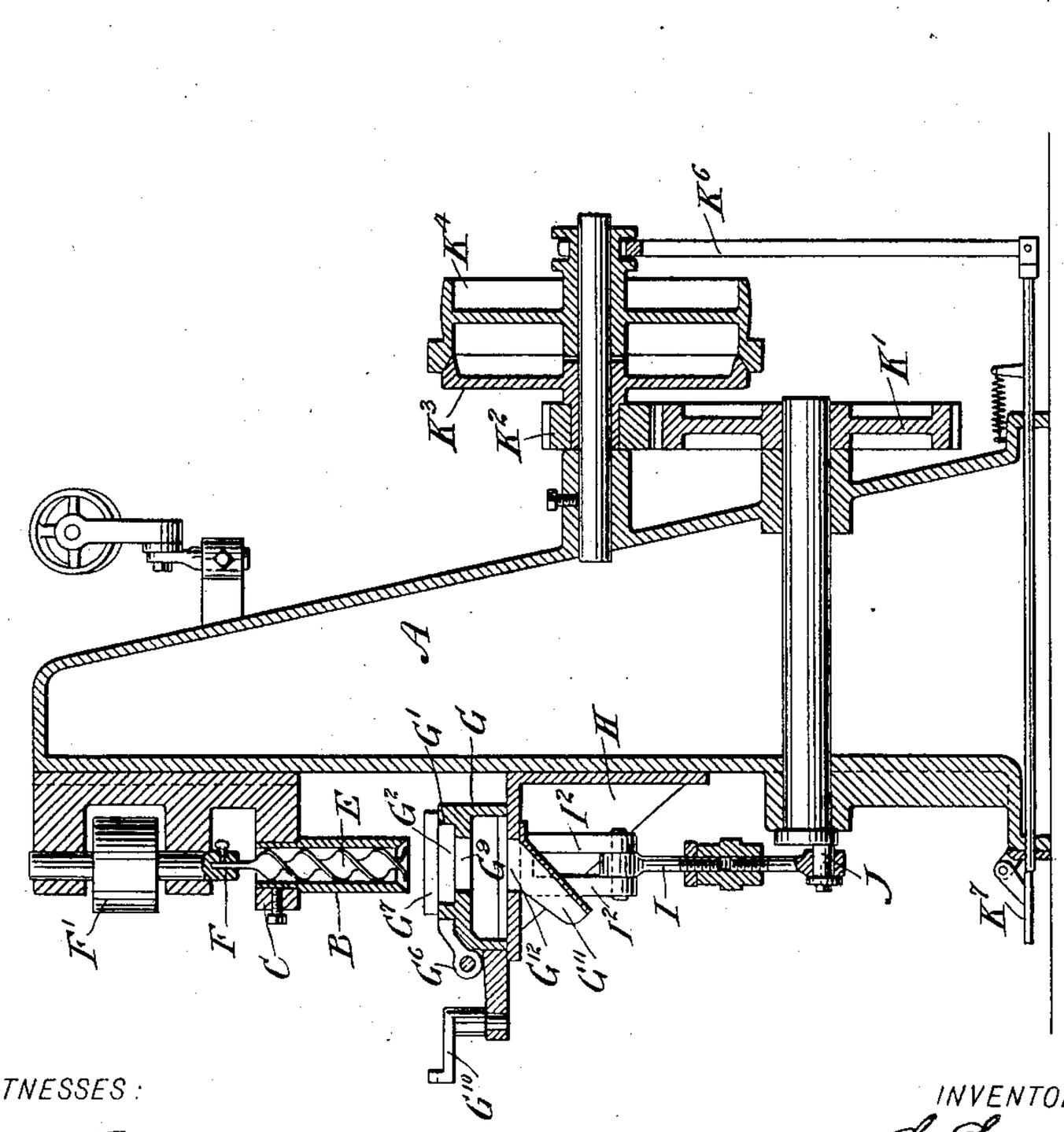


Fig. 7.



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UNITED STATES PATENT OFFICE.

CHARLES SEYMOUR, OF DEFIANCE, OHIO, ASSIGNOR TO THE DEFIANCE MACHINE WORKS, OF SAME PLACE.

PUNCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 608,484, dated August 2, 1898.

Application filed December 3, 1897. Serial No. 660,686. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SEYMOUR, of Defiance, in the county of Defiance and State of Ohio, have invented a new and Improved Punching-Machine, of which the following is a full, clear, and exact description.

The invention relates to woodworking machinery; and its object is to provide a new and improved punching-machine more especially designed for forming a D-opening in handles for shovels, spades, forks, and other articles and devices, the arrangement permitting of forming the opening by one operation in a very simple and effective manner and without requiring skilled labor.

The invention consists of novel features and parts and combinations of the same, as will be hereinafter more fully described, and pointed out in the claim.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of the improvement. Fig. 2 is an enlarged plan view of the handle-holder. Fig. 3 is an enlarged sectional side elevation of the punch with the auger. Fig. 4 is a plan view of the same. Fig. 5 is a plan view of the handle just prior to completion. Fig. 6 is a like view of the finished handle. Fig. 7 is a vertical section of the machine, and Fig. 8 is a front elevation with the table and adjacent parts in transverse section.

The improved machine is mounted on a suitably-constructed frame A, formed in its upper portion with a bearing A′ for the reception of the reduced upper end B′ of a depending punch or chisel B, having its lower cutting edge B^2 in the shape of the outline of a D for forming an opening D′ in the blank of the handle D, as is plainly shown in Fig. 6. The chisel or punch B is made hollow, and in it revolves an auger E, having its cutting edge E′ within the cutting edge B^2 of the chisel B, as plainly indicated in Fig. 3, so that the auger cuts out the major portion of the handle-blank and forms the opening D′, and the cutting edge B^2 of the chisel B punches out the rest of the material and completes the opening D′. To attain this end, the lower portion of the auger is increased in width, so as to reach into immediate proximity with the circular edges of the chisel. It may be seen from Fig. 3 that the chisel B is provided with an interior bevel at its lower end to form the cutting edge. This bevel extends entirely around the cutting edge of the chisel. The auger E, which runs through the chisel, has its lower end enlarged, so as to extend into immediate proximity with the edges of the chisel. This arrangement results in the placing of the cutting edges of the auger in a plane below the upper edge of the bevel of the chisel, so that a clearance-space is thus provided through which the chips cut by the auger may be moved, and thus clogging of the auger is prevented.

The shank E^2 of the auger E is secured in a tool-holder F, secured on the shaft of a pulley F′, connected by a belt F^2 with other machinery for imparting a rotary motion to the said pulley F′, the tool-holder F, and the auger E, so as to rotate the latter within the chisel or punch B.

The handle-blank of the handle D is fed to the punch B and the auger E, and for this purpose I provide a holder G, secured on the top of a bracket-shaped slide H, mounted for vertical movement on the front of the frame A and provided with a U-shaped projection I^2, between the arms of which is located a pivotally-connected pitman I. The pitman I is connected in turn with a crank-arm J on the forward end of a transversely-extending shaft K, mounted to rotate in suitable bearings in the lower portion of the frame A.

On the rear of the shaft K is secured a gear-wheel K′, in mesh with a pinion K^2, journaled on a stud carried by the frame A and attached to a friction-disk K^3, adapted to be engaged by a friction-pulley K^4, mounted to rotate loosely on the stud and connected by a belt K^5 with suitable machinery for imparting a rotary motion to the said friction-pulley K^4. The latter is shifted transversely on the stud by a suitable shifting-fork K^6, adapted to be actuated by a pedal K^7, so as to move the friction-pulley K^4 in engagement with the friction-disk K^3 to rotate the disk and the pinion K^2 and revolve the gear-wheel K′ and the shaft K, so that the crank-arm J

and pitman I impart a vertical reciprocating motion to the slide H and the holder G.

The holder G is in the form of a horizontally-disposed table formed on its top with a longitudinally-extending guideway G′, in which are mounted to slide toward and from each other plates G^2 G^3, formed with right and left hand nuts G^4 G^5, engaged by corresponding threads on a screw-rod L, mounted to rotate in a suitable bearing G^6, carried by the holder G. The screw-rod L is provided with a hand-wheel L′, under the control of the operator, for turning the screw-rod so as to move the plates G^2 and G^3 simultaneously toward or from each other.

On the top of the plates G^2 and G^3 are pivoted the cheeks or clamping-jaws G^7 G^8, respectively, adapted to engage the sides of the handle-blank to securely hold the same in place during the formation of the opening D′.

In the holder G, between the cheeks G^7 G^8, is formed an opening G^9 for the passage of the material punched out of the blank by the chisel B and a portion of the material cut by the bit E′ of the auger E. Attached to the bottom of the horizontal portion of the slide H and surrounding the opening G^{12} therein is a chute G^{11} for receiving and discharging the chips that drop from the opening G^9 in the table G. This chute passes forwardly and downwardly between the arms of the U-shaped projection I^2, before described. The holder G is also provided with a rest G^{10}, extending in front of the machine beneath the bearing G^6, as shown in Fig. 1, for the shank D^2 of the handle D to rest on, as is plainly indicated in the said Fig. 1.

The operation is as follows: The handle, with its blank, is passed between the cheeks G^7 G^8, and the operator upon turning the hand-wheel L′ moves the cheeks toward each other, so as to clamp the blank in place directly over the opening G^9. The operator now presses the pedal K^7, so as to throw the friction-pulley K^4 in engagement with the friction-disk K^3 and impart a vertical reciprocating motion to the holder G and the blank carried thereby, as previously explained. The blank in its upward movement is brought in contact with the cutting edge B^2 of the chisel B and in contact with the bit E′ of the auger E, and as the latter rotates at a high rate of speed it cuts out the blank, and the cutting edge B^2, moving with it, simultaneously punches or chisels out the remainder of the material in the blank, finally forming the opening D′. On the downward movement of the holder the finished handle is carried along and moved out of engagement with the fixed chisel B and the auger revolving therein. The operator now turns the hand-wheel L′ in the opposite direction to open the cheeks G^7 G^8 and remove the finished handle and to place another blank in position. The above-described operation is then repeated.

It is expressly understood that the cutting edge of the auger extends close to the bevel forming the cutting edge B^2 for the chisel B, so that the two cutting edges coact for the removal of the material to form the D-opening in the handle.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

In a punching-machine, the combination with a frame and the punching-tool carried thereon, of a bracket-shaped slide mounted to move vertically on the frame and having a horizontal portion provided with an opening, a chute attached to the bottom of the horizontal portion of the slide and surrounding the opening to conduct the chips therefrom, a U-shaped projection straddling the chute and attached to the horizontal portion of the slide, means in connection with the projection by which to impart reciprocal movement to the slide, a holder mounted on the horizontal portion of the slide and having a centrally-located opening registering with the opening in the slide, the holder also having a horizontal guideway in its top face, plates mounted to slide toward and from each other in said guideway, clamping-jaws respectively attached to the plates so as to hold the work between them, and means carried by the table for moving the plates toward and from each other to grasp and release the work.

CHARLES SEYMOUR.

Witnesses:
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JOSEPH BAUER.