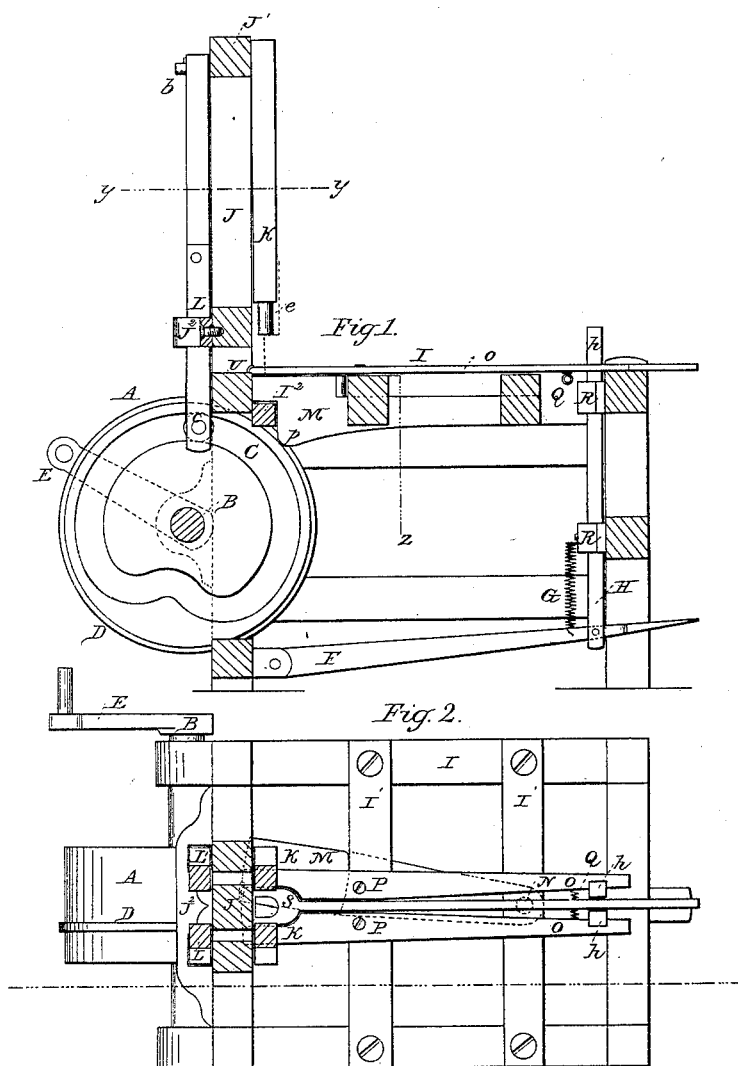


W. Wells,

*Mortising Machine.*

$\Pi^2_{45,546}$ .

*Patented Dec. 20, 1864.*



Witnesses.

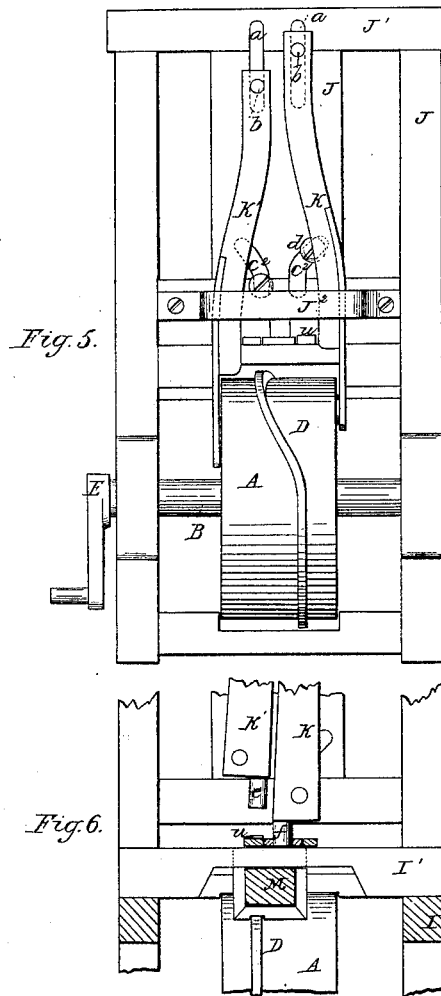
C. L. F. H. L.  
 Henry Morris

Inventor:

Houffels  
per Munn & Co  
Attorneys.



*W. Wells,*  
*Mortising Machine.*  
*N<sup>o</sup> 45,546.* *Patented Dec. 20, 1864.*



*Witnesses.*  
*W. L. Topple*  
*Henry Morris*

*Inventor*  
*W. Wells*  
*per J. M. Smith*  
*attorney*

# UNITED STATES PATENT OFFICE.

WILLIAM WELLS, OF MIDDLETON, MASSACHUSETTS.

## IMPROVEMENT IN MACHINES FOR MAKING SHOVEL-HANDLES.

Specification forming part of Letters Patent No. 45,546, dated December 20, 1864.

*To all whom it may concern :*

Be it known that I, WILLIAM WELLS, of Middleton, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Machines for Making Shovel-Handles; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical sectional elevation of a machine constructed after my invention, taken on the line *x* of Fig. 2. Fig. 2 is a plan view of the machine, showing the upright frame J in cross-section on the line *y*. Fig. 3 is an elevation of the machine as seen from the opposite side to that shown in Fig. 1, the part of the frame that carries the crank E being broken away to show the cam C'. Fig. 4 is an elevation of the lower part of the front of the machine. Fig. 5 is an elevation of the machine as seen from behind. Fig. 6 is an elevation, partly in section, showing a part of the machine drawn on the line *z* of Fig. 1.

Similar letters of reference indicate like parts.

This invention consists in a novel construction of machinery for cutting out and finishing the "D part" or heads of shovel-handles, in which the cutters are operated automatically by means of cams.

I is a rectangular frame, of suitable strength and height, and of such general proportions as will suit the convenience of the operators, having an upright frame J at its end. A cylinder, A, is placed below the frame J, its shaft B revolving in bearings formed for it in brackets projecting from the back part of the main frame I. Cam-grooves C C' are formed in the ends of the cylinder, receiving, respectively, friction-wheels *c c'*, which project from vertical arms L L', whose reciprocations are guided in slots cut through a bracket, J<sup>2</sup>. The cam-grooves are of like shape, but are so placed as to actuate the arms L L' one after the other. In the upper part of the frame J are two vertical slots, *a*, of a height more than equal to the depression of the cams *c c'*, which receive pins *b b'*, to connect the upper ends of the arms L L' to the upper ends of cutter-

stocks K K', placed on the front of the frame J. It follows that as both the cutter-stocks and arms are suspended from the pins *b b'* respectively, they must move up and down together. Cam-slots *c<sup>2</sup> c<sup>2</sup>* are made in the lower part of the upright frame of the form shown in Fig. 5, which receive pins or arms *d d*, projecting from the back part of the cutter-stocks. The lower part of the slots *c<sup>2</sup>* are made vertical, and their upper parts are inclined away from each other at an obtuse angle, as seen in Fig. 5. The cutter-stocks are armed with cutters or stamps with chisel-edges, each being made of one piece of metal in this example of my invention, and of the shape of the opening to be made in the shovel-handle. Upon the top of the main frame I are placed clamps O O, separated from each other far enough to receive the shovel-handle S, and fixed to one of the cross-pieces I' by pivot-pins P P, about which they have a partial rotation. Their inner ends are shaped so as together to form a receptacle or matrix for the D part of the handle S, within which it may be clamped when the clamps O are rotated in the proper direction.

H is a vertical bar, held to the forward end of the main frame by brackets R R, within which it is made to slide vertically by means of the treadle F. The upper end of the bar H is bifurcated, so that its forks *h h* extend upward next to and on each side of the shovel-handle S when it is in position between the clamps. The forks are wedge-shaped on one side, their angular faces being next to the clamps O.

When the treadle is depressed, the bar H is drawn downward, thereby causing the angular forks to crowd between the sides of the shovel-handle and the clamps, whose outer ends swing open about their fulcrum-pins P P, their inner ends consequently swinging toward each other, so as to clamp the head of the shovel. Thus the head and shank of the handle are both held snugly by the same operation.

M is a swinging bed-piece, which is fitted beneath the cross-pieces I', to one of which it is pivoted at its outer end, as seen at N. Its inner end rests upon the cross-piece I<sup>2</sup>, and is elevated at that part of the frame, so that its upper face is flush with the cross-pieces I' to

give support to the clamps O and the shovel-handle, which rests upon it. The bed-piece M constitutes the support for the shovel-handle when the vertical cutters act upon it, and in case it is made of metal its upper surface is to be fitted with a bed of wood or other suitable material to receive the cutters in their descent, so as to preserve their edges from injury. A cutter, *n*, of curved form, as seen in Fig. 1, is secured to the end of the swinging bed M near its left-hand corner. It extends over the edge of the adjacent clamps when the bed-piece is in its normal position, and its shape is such as to give the required convexity to the extreme end of the head of the shovel-handle when it moves along it. The bed-piece M extends downward in front of the cross-piece P<sup>2</sup> toward the periphery of the cylinder A, to enable a fork, *p*, formed upon it at that point to embrace a peripheral cam, D, which extends around the cylinder, as seen in the drawings. The action of the cam D is to swing the bed-piece about its center of motion N, thereby bringing its concave cutter *n* along the head of the shovel-handle, so as to bring it to the required shape, curved in two directions, the longitudinal curve or contour being given by reason of the curved path of the cutter about the center of motion N, and the rounded form of the head being given by the concave shape of the cutter.

When the cutter-stocks K K' and all the other parts of the machine are in their normal position, the head of the shovel-handle S will lie within vertical lines, extending downward from the inner sides of the cutters, so that when they descend they must have a sidewise motion in order to be placed vertically (nearly) above the head of the handle. This is accomplished by the slots *c*<sup>2</sup> and the guiding-pins *d* *d*.

The position of the cams or their adjustments are to be such that, when the shovel-handle is properly clamped the rotation of the cylinder in the direction of the arrow will cause the cutter *e* to descend and cut out a portion of the head of the handle, making a hole therein of the shape required, but of smaller dimensions than is necessary in the finished handle, the descent of the cutter, as is plainly seen, being caused by the cam C

and its lateral movement, which is required to bring it vertically above the center of the handle, being caused by the cam-slot *c*<sup>2</sup>, *n* which its guiding-pin *d* travels when the said descent takes place.

The continuous rotation of the cam-wheel carries the cutter *e* upward and the upper part of its cam slot *c*<sup>2</sup> carries it sidewise again to its normal position, to give way for the like descent and vibration of the cutter-stock K', whose cutter *e'* is of the same shape but larger than the cutter *e*, so as to bring the D-opening in the handle to the proper size and shape. So soon as the cutter *e'* has been withdrawn from the D opening in the head of the shovel S far enough to clear its edge, the bed-piece M begins its vibration to the right in order to cut the outer end of the head to the proper shape, as above explained. The shovel-handle is then released from the clamps O and taken out and a fresh one supplied in its place.

The handles are steamed or otherwise softened, and a circular hole as large as the shortest diameter of the D-opening is bored in each before being submitted to the operation above-mentioned.

The cam-cylinder may be driven by means of the crank E or other suitable means, according to the speed required.

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

1. Clamping the shovel-handle both at its head and along its shank by means of the clamp O and bar H, with its forks *h* *h*, during the operations above described, substantially as above set forth.

2. Completing the D-opening in the head of the shovel-handle by means of the suspended vertical die-cutters *e* *e'*, of different sizes, operated in succession and brought vertically over the shovel-head, substantially as above described.

3. The swinging bed-piece and its cutter *n*, for forming the end of the shovel-head, constructed and arranged substantially as above described.

WILLIAM WELLS.

Witnesses:

JOSEPH A. BATCHELDER,  
PARKER WELLS.