

A. DODDS.  
WOOD CARVING MACHINE.

No. 426,408.

Patented Apr. 22, 1890.

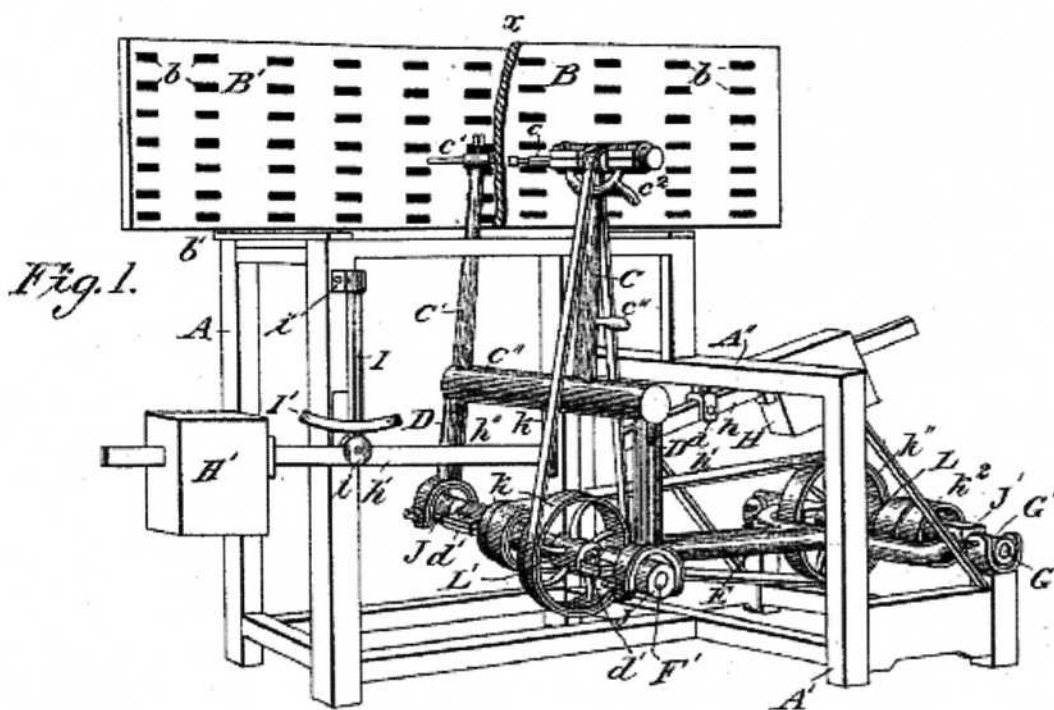


Fig. 1.

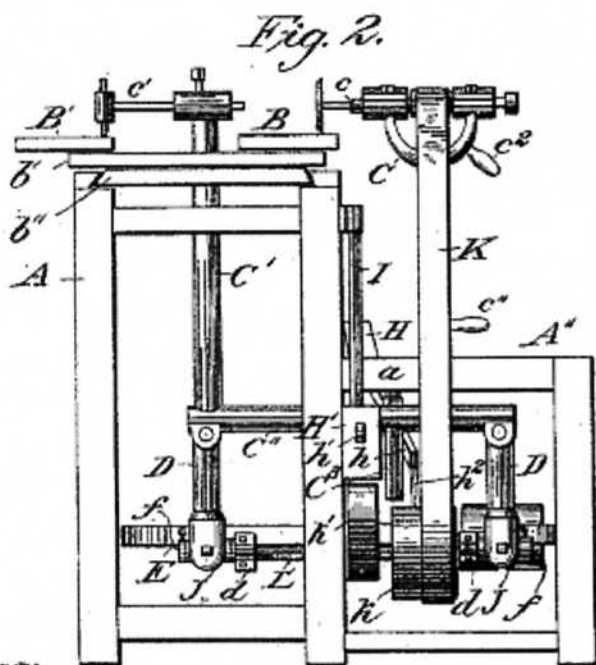


Fig. 2.

Witnesses:  
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 John C. Buchanan

Inventor:  
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 By John J. Kelley  
 Attorney

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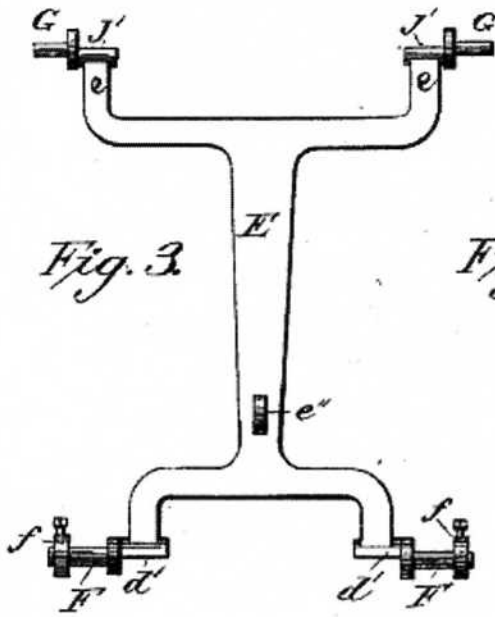


Fig. 3.

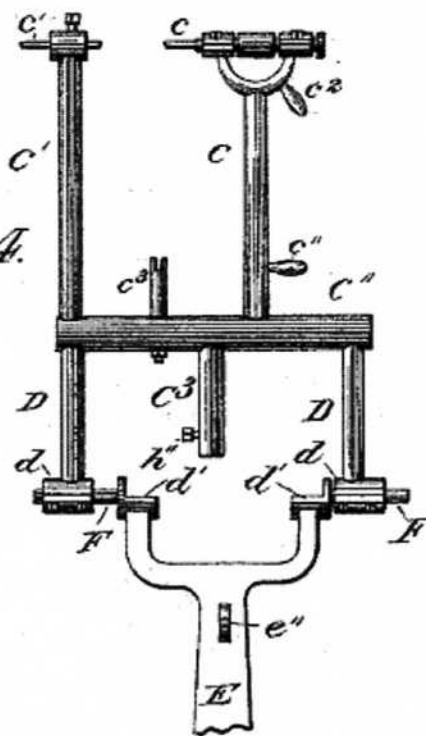


Fig. 4.

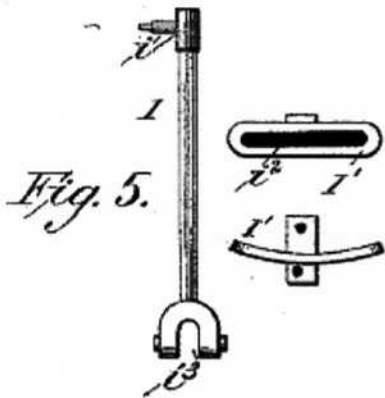


Fig. 5.

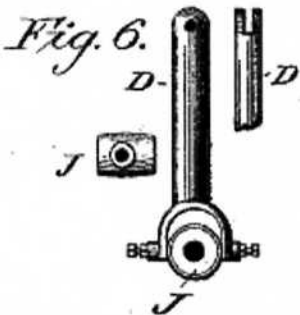


Fig. 6.

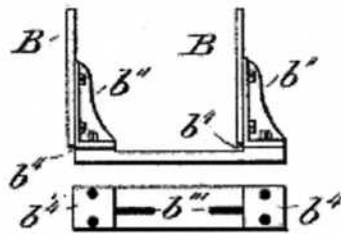


Fig. 7.

Witnesses:  
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# UNITED STATES PATENT OFFICE.

ALEXANDER DODDS, OF GRAND RAPIDS, MICHIGAN.

## WOOD-CARVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 426,408, dated April 22, 1890.

Application filed October 4, 1889. Serial No. 326,063. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER DODDS, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented a new and useful Improvement in Wood-Carving Machines, of which the following is a specification.

My invention relates to improvements in machines for doing heavy wood-carving; and the objects of my invention are, first, to provide a wood-carving machine for raised work that is supported upon an independent frame, and thus obviate the necessity of attaching one portion to one place or position in the mill and another portion to another place or position; second, to perfectly balance each of the several parts of the machine in every direction; third, to provide a wood-carving machine with which the work may be performed upon either vertical or horizontal tables; fourth, to provide a wood-carving machine having a perfectly free adjustment in all directions, and, fifth, to provide a wood-carving machine in which the working parts of the machine will be supported upon adjustable bearings independent of the shafts. I accomplish these results by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective of my carver. Fig. 2 is an elevation of the same with horizontal tables. Fig. 3 is a plan of the main arm or support, showing the manner of supporting the working portions of the carver independent of the shafting. Fig. 4 is a plan of the end of the main arm and of the spindle-frame, showing a modified form of attachment for the purpose of producing the lateral adjustment of the spindle-frame. Fig. 5 is a detail view of the fulcrum-bar and guide for the lever and weight that counterbalances the spindle-frame. Fig. 6 is a plan of the arm and box that I commonly use for giving a lateral motion to the spindle-frame. Fig. 7 is the table-bed and girt.

Similar letters refer to similar parts throughout the several views.

A and A' is the frame upon which I support my machine.

B and B' are the tables to which I attach the pattern to be worked from and the material to be worked upon.

C is the spindle arm or support.

C' is the arm that supports the tracer.

C'' is the cross-bar that connects and supports the spindle and tracer arms. 55

D D are the standards connecting the cross-bar C'' with the main arm of the machine.

E is the main arm of the machine.

F F are the bearings upon the main arm for the support of the spindle-frame. 60

H and h is a weight and lever for counterbalancing the weight of the main arm.

H' and h' is a weight and lever for counterbalancing the weight of the spindle-frame. 65

I is a fulcrum-bar for the support of the lever h'.

I' is a guide for holding the lever h' in position.

J is a swiveled box for the support and adjustment of the standards D. 70

K is the spindle-belt.

K' is the driving-belt.

L is the main shaft, and L' is the counter-shaft. 75

In constructing my machine I make a solid frame having a high portion A for the support of the tables and a lower portion or wing A' for the support of the main arm and shaft of the machine in such a position that the main arm will stand below the tables near to and parallel with the floor, and the spindle-frame will project upward from the free end of the main arm to the tables and be supported in its vertical position by the lever h', the weight H', and the oscillating fulcrum I. I then construct an arm E substantially as shown. At one end of this arm I form boxes J' for the support of the main shaft L, and at the outer ends of these boxes I form bearings G, which are solidly attached to the arms e and are fitted to work freely in bearings G', secured to the frame for the purpose of supporting the main arm E, and at the opposite end of the main arm I form similar boxes e' for the support of the counter-shaft L' and bearings F for the support of the spindle-frame. 85 90 95

My object in forming the lugs or bearings F and G solidly upon the arm is to avert the necessity of extending the shafts L and L' through to the main bearings for the support of the arms D and E and bringing their entire weight upon the working bearings of the machine. By this means I can support the 100

shafts entirely independent of the main bearings and reduce the friction of running the machine to the minimum.

I attach a tight and loose pulley  $k^2$  to the main shaft to receive the main driving-belt and a driving-pulley  $k''$ , from which the driving-belt  $K'$  leads to the driven pulley  $k'$  on the counter-shaft.

For the purpose of giving the spindle a horizontal motion right and left I fit a box  $J$  to turn freely upon the bearings  $F$ , and to give the spindle and tracer frame a free lateral motion I pivot two standards  $D$   $D$  at one end to the adjustable boxes  $J$  and at the other ends to the cross-bar  $C''$ , that supports the spindle and tracer arms  $C$  and  $C'$ , and to prevent the boxes  $J$   $J$  from sliding off of the bearings  $F$ , I place a collar  $f$ , Fig. 3, upon each bearing outside of the boxes, though I sometimes provide for the lateral motion of the spindle and tracer frame by making the bearings  $F$  long and attaching the standards  $D$  solidly to the cross-bar  $C''$  and placing boxes  $d$  at the lower end far enough apart so that they may be made to slide a short distance upon the bearings, as shown in Fig. 4, and carry the entire spindle-frame bodily.

The counter-shaft  $L'$  is supported in boxes  $d'$  upon the main arm  $E$  in such a manner that none of the weight of the spindle-frame is brought to bear upon it, and is provided with a driven pulley  $k'$ , which receives the driving-belt  $K'$  from the driving-pulley  $k''$ , and with a driving-pulley  $k$ , that drives the spindle-belt  $K$  and the spindle.

The spindle and tracer frame consists of the standards  $D$ , the cross-bar  $C''$ , the upright arms  $C$  and  $C'$ , and a depending arm  $C^3$ .

The spindle  $c$  is supported in boxes at the upper end of the spindle-arm and is driven by the belt  $K$ . The tracer  $c'$  is supported at the upper end of the tracer-arm  $C'$  directly opposite to and in line with the spindle, and the two are so fitted that the cutter in the spindle will be forced into the material being carved the exact distances that the tracer travels upon the pattern.

For the purpose of overcoming the weight of the main arm  $E$ , I attach a lever  $h$  by means of a connection  $h^2$  to the arm at  $e''$ , and by means of the fulcrum  $a$  to the girt  $A''$ , and provide it with a weight  $H$ , placed in a proper position on the lever to exactly balance the weight of the arm; and to overcome the weight of the spindle-frame I pivot a lever  $h'$  to the depending arm  $C^3$  at  $h''$ . The fulcrum of this lever is formed by pivoting the lever to an upright bar  $I$  at  $i$ , the bar being in turn pivoted to the frame of the machine at  $i'$  in such a manner as to allow the lever to swing freely to the right and left with the spindle-frame. At the outer end of the lever  $I$  I place a weight  $H'$  in a proper position to nearly balance the weight of the spindle-frame, the opening  $i^2$  in the lower end of the bar  $I$  being large enough so that the lever can be swung

sidewise sufficiently to allow a free lateral motion to the spindle-frame.

To prevent the bar  $I$  and the lever from swinging over out of place, I form a guard  $I'$ , with a slot  $i^2$  for the free action of the bar, and bolt it solidly to the frame, and pass the bar through the slot in such a manner that it may be worked freely to the right and left, but cannot be worked sidewise.

For manipulating the spindle-frame I attach handles  $e''$  and  $e^3$  in position upon the spindle-frame to be conveniently reached and operated. By this arrangement the several parts of the machine may be so perfectly balanced that the spindle may be easily moved in any direction, whether up or down, to the right or left, or to or from the operator, and yet be positive in its action, doing its work without any jar or trembling motion to the spindle, and the spindle-frame when at rest will invariably stand in a vertical position and in line.

For securing my pattern to be worked from and the material to be worked upon I provide two tables  $B$  and  $B'$ , which I usually stand upon edge, as shown in Fig. 1. In this view  $B$  is the table for the support of the material to be operated upon, cut off at  $x$  to show the position of the tracer, and  $B'$  is the table for the support of the pattern to be worked from, each table being provided with a series of apertures  $b$ , through which bolts may be passed for securing the pattern and the material. I secure these tables to girts  $b'$ , attached to the top of the frame, and support them with standards  $b''$ , as shown.

I find that in many instances it is desirable to have the pattern and the object to be carved lie horizontally upon the machine, and for this purpose I lay the tables down, as shown in Fig. 2, and place a vertical tracer-point  $e'$  in the tracer-head. The action of the machine is applicable to either form of table.

In throwing the spindle up or down the bearing  $G$  upon the main arm of the machine turns in the boxes  $G'$ . To move the spindle to the right or left, the boxes  $J$  on the spindle-frame turn upon the bearings  $F$  on the main arm of the machine, and to give a lateral motion to the spindle the frame is swung upon the standards  $D$  by means of the pivot-joints  $C^3$  at the cross-bar and  $d$  at the adjustable boxes  $J$ , as shown in Figs. 1, 2, and 6, or when a rigid spindle-frame is used by sliding the boxes  $d$  at the lower end of the frame upon the bearings  $F$  on the main arm, as shown in Fig. 4.

It is not necessary to form the depending arm  $C'$  for the attachment of the lever  $h'$  to the spindle-frame. A simple lug  $e^3$  may be attached either above or below the cross-bar  $C''$  for the purpose, my object in using the depending arm being that it is perfectly rigid and may be extended down, so that I can attach the lever nearly down to the line of pivoting the spin-

dle-frame to the main arm, and thus enable me to carry the spindle from side to side the entire length of the table, if necessary, without throwing the oscillating fulcrum I but a short distance from its natural center of gravity, and also enables me to place the weight II' upon the lever in such a position as to so perfectly counterbalance the weight of the spindle-frame that the spindle may be easily moved in any direction and will stand in any ordinarily-desired position with no other support, but with a natural tendency to seek a direct vertical position.

I sometimes find that it is desirable to slide my tables endwise or sidewise, and for this purpose I make a bed  $b''$ , Fig. 7, nearly the entire length of the tables and arrange it with slides  $b^3$ , so that it may be easily slid endwise, and for the lateral motion I make a slot or slots  $b'''$  in the girts  $b^2$ , so that they may be slid upon the bolts that secure them to the bed, the ends  $b^4$  being prepared for the reception and support of the tracer or supports  $b'$ , and secure the tables in place by means of bolts or other suitable device through the bed  $b''$  and the girts  $b^2$ .

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

1. A wood-carver having a frame for the support of the entire machine, in combination with a main arm pivoted at one end to bearings upon the frame and at the opposite end to a spindle-frame, a frame for the support of the spindle and the tracer-point, pivoted to the free end of the main arm and projecting upward from the main arm to the tables and supported in its vertical position by means of a lever, a weight, and an oscillating fulcrum, shafts, pulleys, and belting, levers and weights for counterbalancing the weight of the main arm and the spindle-frame, and tables for the support of the material operated upon, substantially as and for the purpose set forth.

2. The combination, in a wood-carving machine, of a frame with an arm having independent bearings attached outside of the shaft-boxes, independent boxes for the support of the shaft, and a shaft and pulleys at one end for driving the counter-shaft, independent bearings at the other end for the support of the spindle-frame, independent boxes for the support of the counter-shaft, a counter-shaft and pulleys, adjustable boxes for the support of the spindle-frame, standards pivoted at one end to the adjustable

boxes and at the other end to the cross-bar  $C''$ , arms for the support of the spindle and tracer, a lever, a fulcrum, and a weight attached to the main arm, a lever, a weight, and an oscillating fulcrum to counterbalance the spindle-frame, and tables, substantially as and for the purpose set forth.

3. The combination, in a wood-carving machine, of a frame, an arm pivoted to the frame, a spindle-frame pivoted to the free end of the arm projecting upward from the main arm to the tables, provided at its upper end with separate arms for the support of the spindle and the tracer-point, and supported in its vertical position by means of a lever, a weight, and an oscillating fulcrum, a tracer, a spindle, a lever, and weight for counterbalancing the arm, a lever, and weight, and an oscillating fulcrum for counterbalancing the spindle-frame, a guard to hold the oscillating fulcrum in line, and tables, substantially as and for the purpose set forth.

4. The combination, in a wood-carving machine, of a frame, an arm pivoted at one end to the frame and at the other end to a spindle-frame, independent adjustable bearings at each end of the arm for the support of the shafting; the arm, and the spindle-frame, adjustable boxes for the support of the arm and the spindle-frame, a spindle-frame, a spindle, a tracer, a lever, and a weight to counterbalance the arm, a lever, a weight, and an oscillating fulcrum for counterbalancing the spindle-frame, a guard, a bed and girt for adjusting the tables, and tables, substantially as and for the purpose set forth.

5. The combination, in a wood-carving machine, of a frame, an arm supported upon independent bearings in adjustable boxes attached to the frame, adjustable bearings and boxes for the support of the spindle-frame, standards pivoted at one end to adjustable boxes and at the other end to the spindle-frame, a weight, a lever, and an oscillating fulcrum supporting the lever for the support of the spindle-frame and arm, a spindle, a tracer, parallel tables attached to adjustable girts having slots to give a lateral motion to the tables, a bed to support the tables, guides for holding the bed in place, shafting, pulleys, and belts, substantially as and for the purpose set forth.

ALEXANDER DODDS.

In presence of—  
 ITHIEL J. CILLEY,  
 AMELIA I. DODDS.