(No Model.)

J. DAVIS.

CARVING MACHINE.

No. 336,096. Patented Feb. 16, 1886.

Fig. 1.

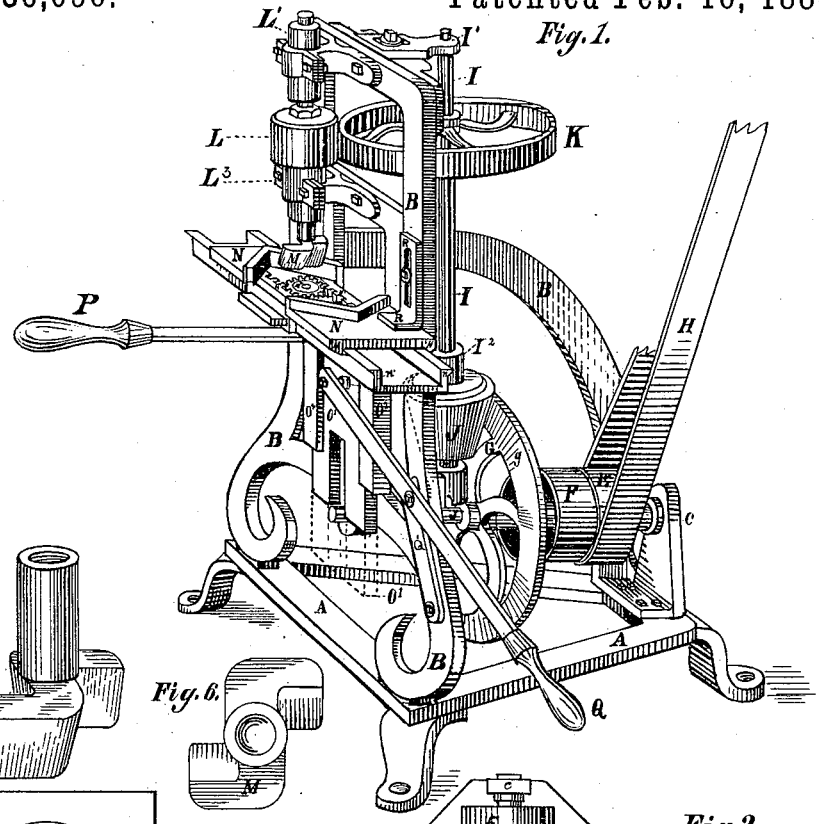


Fig. 4.

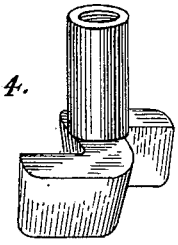


Fig. 6.

Fig. 5.

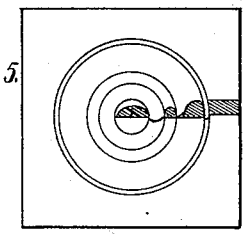


Fig. 2.

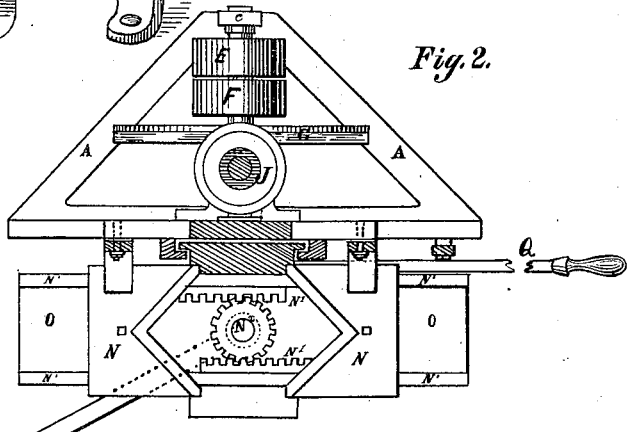
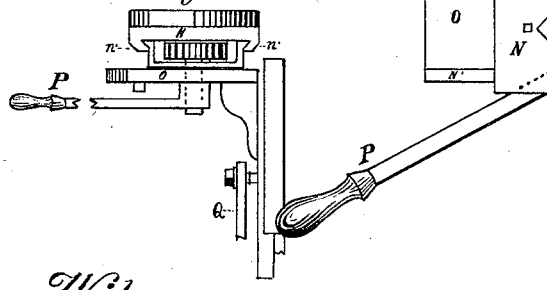


Fig. 3.



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JOHN DAVIS, OF ALBANY, NEW YORK.

CARVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 336,096, dated February 16, 1886.

Application filed November 23, 1885. Serial No. 183,792. (No model.)

To all whom it may concern:

Be it known that I, JOHN DAVIS, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented a new and useful Machine for Carving Lumber or Metal, of which the following is a specification.

My invention relates to a machine for the purpose of turning, carving, and ornamenting lumber or metal; and the object of my invention is to produce a simple machine, which will carve or turn a panel or other piece of lumber or metal quickly, positively, automatically, and without the use of lathe and chisel, performing its work directly, without the necessity of a skilled mechanic to operate it. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 shows my machine in perspective. Fig. 2 shows a plan of my machine through the line *x x*. Fig. 3 is a vertical section of my machine through the line *w w*. Figs. 4 and 6 represent my knife. Fig. 5 is a plan of a corner-block, showing also a vertical section of it.

Similar letters refer to similar parts throughout the several views.

The horizontal frame A, suitably supported, and the uprights B B form the frame of my machine, and may be constructed as shown in the drawings, or in any suitable manner and of any material.

To the frame A, I attach the bearing C, in which revolves the shaft D, carrying the loose pulley E, the tight pulley F, together with the beveled wheel G. The shaft D also revolves in a bearing attached to the frame B. The wheel G is provided with a broad rim, *g*, which is beveled toward the periphery, being thicker at the concave edge of the rim *g* than at the convex edge. The shaft I revolves in the bearings I′ and I², attached to the frame B, and carries at its lower extremity the beveled friction-wheel J, constructed of felt, rubber, or like substance, or of metal, and near its upper extremity the wheel K, each securely attached thereto. The beveled wheel J is placed in close connection with the beveled portion *g* of the beveled wheel G by proper adjustment of their respective bearings, and the beveled portion of the wheels J and G is so proportioned that every part of the rim *g* which faces the beveled friction-wheel J presses against it as they revolve, and the friction generated by the revolution of G against J causes the friction-wheel J to revolve. The wheel K is securely attached to the shaft I, and has its periphery placed in contact with the friction-wheel L. The friction-wheel L is securely attached to the shaft L′, which revolves in the bearings L² and L³, attached to the frame of the machine.

The friction-wheel L may be constructed of felt, rubber, or other substance or metal, and is so adjusted that it presses closely against the periphery of the wheel K, and the friction generated by the revolutions of the wheel K against the friction-wheel L causes L to move. The shaft L′ has a thread cut onto its lower end, upon which the knife M is screwed. The knife M has a nut attached to it, which is threaded to mesh with the thread on the shaft L′, upon which shaft it is placed to perform its work.

The knife M, Figs. 4 and 6, is composed of two or more inclined blades having their lower edge sharpened and cut in any pattern to make the required ornament, molding, or scroll, which may be required. The blades face in opposite directions, forming the knife into the shape of the letter **Z**, Fig. 6, the horizontal portions representing the blades.

The knife may be made as above described, which is the preferable way, or it may be a common molding-knife, and yet accomplish the object of my invention.

When the belt is placed on the tight pulley F, and the machine is at work, the beveled wheel G revolves, causing, by the friction generated, the beveled friction-wheel J, against which it presses, to revolve, and the beveled friction-wheel J being smaller in circumference than the wheel G revolves much faster than G. The wheel K being attached to the shaft I is thus set into motion, and as it presses against the friction-wheel *h* the friction-wheel L is caused to revolve, and therefore the shaft L′, to which it is attached, and therefore the knife M, which is attached to it. A very high rate of speed is obtained by my arrangement of the wheels

G, J, K, and L. The beveled wheel G being larger than the friction-wheel J causes it to revolve many times to every revolution of the beveled wheel G, and the wheel K being much larger than the friction-wheel L causes L to make many more revolutions than the beveled friction-wheel J. I have thus obtained five thousand revolutions of the knife per minute.

The advantage gained by causing the machine to be run by friction rather than by belt and pulley, or by cog-pulleys, is that the belts cause a jogging and an uneven motion to be imparted to the wheels, caused by the seams of the belts, and also by the uneven wearing of their surface. The same uneven motion is caused when toothed pulleys or cog-wheels are used for gearing. By friction-power, applied as herein described, all that tremor and uneven motion is reduced to a minimum, and the result is a perfectly uniform and even motion. This uniformity of motion is necessary in performing the work for which my machine is designed. The knife must cut perfectly true and evenly or the panel, corner-piece, or molding will be out of proportion, rough, and practically useless.

For the purpose of holding the piece of wood or metal in position for cutting, I have provided a vise and means for operating it, which I now proceed to describe. To each of the jaws N N of the vise is attached on the under side a notched rack, N′ N′, which meshes with the cogs on the wheel N^2. Along the under edges of the jaws N N is placed a strip of wood or metal, *n*, which forms with the jaws N N a groove, and into this groove the tongue *n′* is placed. The tongue *n′* is attached to the board or table O. The lever P is immovably attached to the cog-wheel N^2, just beneath the table O.

The mouth of the jaws N N may be made to fit a square block, as shown in Figs. 1 and 2, or they may be made to conform to the shape of the piece upon which the work is to be performed. As the lever P is turned, it being attached to the cog-wheel N^2, the cog-wheel N^2 is turned, and the notched racks N′ N′, meshing with the cog-wheel N^2 and attached to the jaws N N, the jaws N N are moved toward each other equally, thereby keeping the center line of the block or piece to be operated on in common at all times with the center of the machine. This is a very important feature of my machine, and in turning corner-pieces and panels it is a most necessary one.

The jaws N N of the vise may be easily removed by simply turning the lever P until the racks N′ N′ are out of the meshes of the cog-wheel N^2, and one of the racks N′ may be placed in contact with the cog-wheel N^2 after the other has been moved toward the center of the machine a short distance, in order to place the corner or side of a block in the center of the machine for the purpose of ornamenting the block after the panel or corner-piece proper has been carved.

For the purpose of raising and lowering the vise to and from the knife, I attach to the table O an upright, O′, which slides freely in the grooves O^2 O^2. The upright O may be constructed of wood or metal, and to it is attached the lever Q. The lever Q is attached to the link Q′, which said link Q′ is attached to the frame B. The link Q′ acts as a movable fulcrum for the lever Q, and when the piece to be carved is placed into the vise and the jaws closed tightly against it, by operating the lever P the vise is raised into the position shown in Fig. 1, by pressing down on the lever Q, and the work is brought into contact with the knife M.

In order that the operator may know when the piece is sufficiently cut and may gage his work, a movable clamp, R, is attached to the frame B, which, by means of a slot and screw, can be adjusted to meet the requirements of the occasion.

The operation of my machine is so simple that an unskilled hand can operate it, and yet so complete that it can perform the work required of it more perfectly than the most skilled mechanic with any other machine in use.

For the purpose of showing the operation of my machine, place a block or piece to be cut, as shown in Fig. 5, between the jaws N N of the vise, turn the lever P, closing the jaws tightly and equally against the block, the center of the block and the center of the knife being in the same vertical line, press down on the lever Q, raising the vise and block, bringing the block into contact with the knife, the knife being attached to the shaft L′, which is securely attached to the friction-wheel L, and the friction-wheel L pressed against by the wheel K, which is attached to the shaft I, which carries the beveled friction-wheel J, operated upon by the beveled wheel G, which is attached to the shaft carrying the fixed pulley F, to which the power is applied by the belt H. Thus all slipping of belts is avoided and the machine is run smoothly and rapidly.

My machine, constructed as described herein, will in one hour, with the aid of a boy, perform a quantity of work which will take a skilled mechanic one day to perform by any other method or machine now in use, to my knowledge, and turn out a better, smoother, and more perfect job.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In machines for carving and turning lumber or metal, a knife, M, attached to the spindle or shaft L′, in combination with a vise provided with jaws N N, meshing with the cog wheel or pinion N^2, operated by the lever P, for the purpose of retaining the piece of wood or metal to be carved or turned in contact with the knife M during the process of carving or turning, and also provided with the upright piece O′, moving in grooves O^2 O^2, connected with lever Q, having a movable

fulcrum, Q′, for the purpose of raising and lowering the vise, all substantially as described, and for the purpose set forth.

2. In machines for turning or carving lumber or metal, the combination of a vise with notched racks N′ N′, meshing with a cog-wheel, N^2, provided with means for lowering and raising it, with a knife, M, friction-wheel L, in connection with the wheel K, with the beveled friction-wheel J, and beveled wheel G, all substantially as described, and for the purpose set forth.

JOHN DAVIS.

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