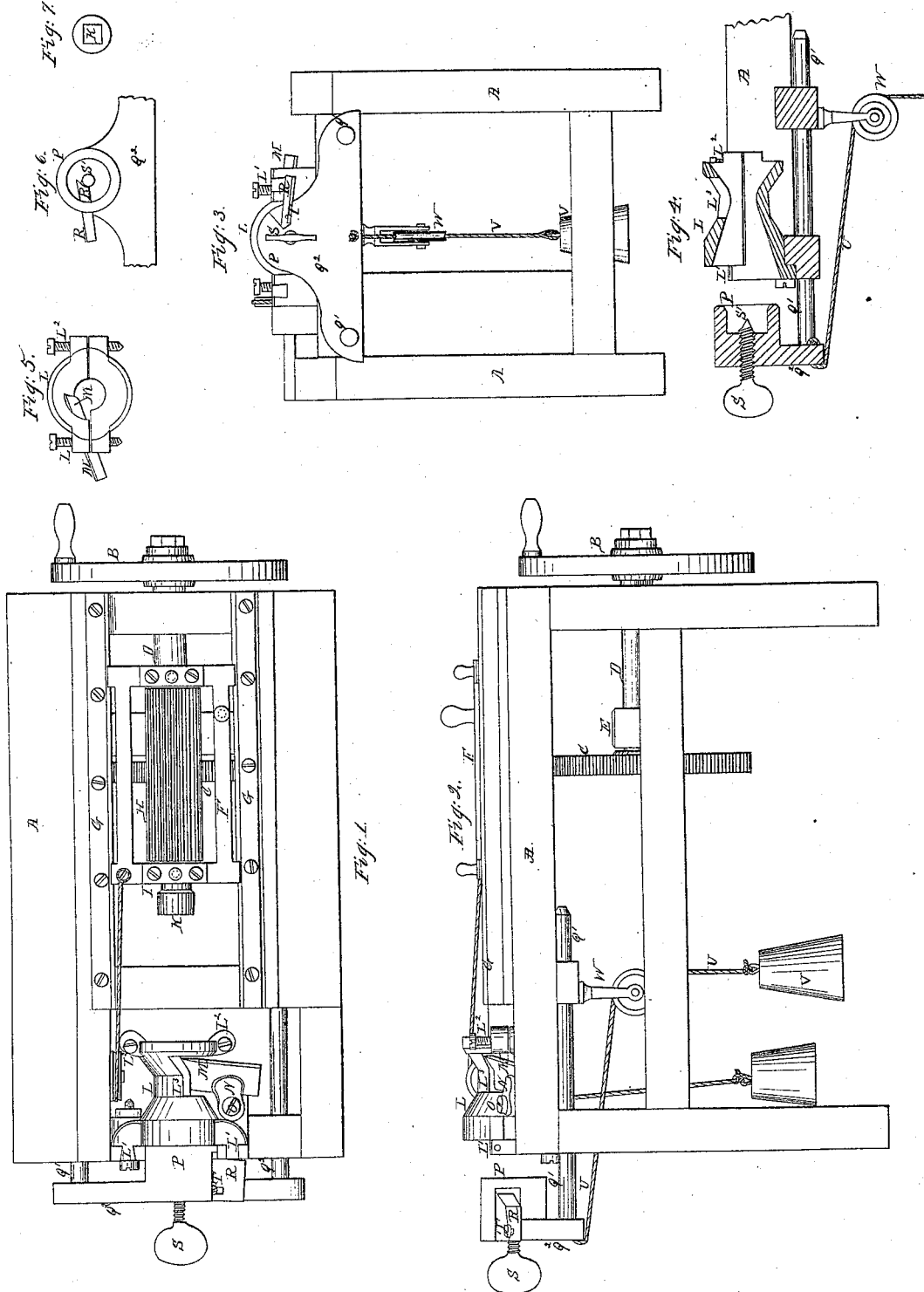


# Weber & Mitchell, Gage Lathe.

N<sup>o</sup> 4,953.

Patented Feb. 5, 1847.



# UNITED STATES PATENT OFFICE.

ELBRIDGE WEBBER AND N. O. MITCHELL, OF GARDINER, MAINE.

## MACHINERY FOR TURNING TREENAILS.

Specification of Letters Patent No. 4,953, dated February 5, 1847.

*To all whom it may concern:*

Be it known that we, ELBRIDGE WEBBER and NATHAN O. MITCHELL, of the town of Gardiner, in the county of Kennebec and State of Maine, have invented a new and useful machine intended principally for the manufacture and finishing of treenails, but applicable to other useful purposes, the description of which is as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a top view or plan of the machine. Fig. 2 is a side elevation of the machine. Fig. 3 is an elevation of the rear end of the machine. Fig. 4 is a vertical longitudinal section of the divided box containing the cutter, made funnel shaped at both ends, resembling a double hollow truncated cone. Fig. 5 is a front elevation of the box, cutter, and set screws. Fig. 6 is a front elevation of the sliding box. Fig. 7 is a front elevation of the square socket into which the tree-nail to be rounded is inserted.

The frame A of this machine is made of a rectangular form of convenient length, breadth, height, and suitable material. The driving parts of the machine consist of a fly wheel B and a driving cog wheel *c* on a horizontal shaft D that turns in stationary boxes E in the frame A. A sliding frame F is arranged to slide horizontally back and forth between two horizontal parallel ribs or ways G, G, fastened to the top of the frame A. A long cog wheel H or pinion of less diameter than the cog wheel C and as long as the treenail to be made is geared into the driving cog wheel *c*. The shaft I of the pinion H turns in suitable boxes in the sliding frame F. A square socket K is formed on the end of the shaft I—said socket being designed to receive the end of the treenail previously squared. In front of the sliding pinion is a metal socket L or double truncated box to receive the point of the tree-nail. This socket resembles in form a cylinder with its two ends flaring outward from the center like a common hour or sand glass. It should be made sufficiently enlarged at both ends to permit the treenail to follow the grain of the wood in passing through the box or socket. This socket is made in two parts as represented in the drawings at Figs. 4 and 5 for the purpose of varying the size of the treenail. The outer or left hand end of the upper section of the socket is secured by a hinge L'. The inner or right hand end

of said upper section is raised or lowered in order to increase or diminish the diameter of the throat of the socket by set screws L<sup>2</sup>. On one side of the neck of this socket is an opening L<sup>3</sup> of a suitable size and shape for the admission of the knife, or cutter M, and for the discharge of the chips. This knife is so formed as to combine the properties of the gouge and the chisel. The knife is secured by a jaw N and set screw O. The box or socket is stationary being firmly attached to the frame A. There is another socket or box P attached to a sliding frame Q' Q<sup>2</sup> to receive and steady the point of the treenail while being pointed by a knife R fixed in said socket. The frame of this socket consists of two parallel horizontal bars Q' fixed in a transverse head block Q<sup>2</sup> said bars Q' being made to slide in corresponding openings in the frame. A center screw S is inserted through the center of the head block into the socket or box having a pivot or point S' on which the treenail is turned while having the end tapered.

The cutter R is a trapezoidal shaped plate having a beveled cutting edge made like a plane iron, and an oblong mortise for the admission of a set screw T by which it is fastened to the socket. It is placed in the throat through which the chips escape. This socket exteriorly is of a cylindrical form. It is held against the stationary socket L by a cord *u*, weight *v*, and pulley *w*.

For varying the size of the treenail the position of the knife or cutter should be varied as well as the diameter of the socket or box. To increase the diameter of the treenail the cutting edge of the knife is removed farther from the center of the socket by loosening the jaw and inserting wedges under the cutter and again tightening the jaw by the set screw. In the drawing the sliding motion of the frame F is represented as being regulated by hand and moved forward during the operation of cutting by a cord, weight, and pulley; but for a full sized machine for the manufacture of all sorts of treenails, to any considerable extent, the sliding motion should be regulated by gear, on the same principle of the clapboard machine, but with a difference of feed.

The piece of wood to be formed into a tree-nail is inserted into the socket K and made fast therein and the machine being put in motion by any convenient and adequate power the other end of the piece of

wood is introduced into the stationary socket L it then comes in contact with the cutter M by which it is reduced to the required diameter, the chips passing out through the throat in the neck of the socket. The end of the treenail then comes in contact with the center pin S' of the sliding socket P on which it turns—its periphery coming in contact with the cutter of said socket by which the treenail is pointed, the said socket moving with the treenail to the left as far as it is intended to go, the cord attached to its frame being at the same time drawn up over the pulley and the weight rising with it.

The division of the stationary or hour-glass, shaped socket is horizontal and for ordinary uses and for hand power will be found most convenient. But for the manufacture of treenails on a large scale and by horse, steam or water power, and where in the same machine it is desirable to vary the size more than is convenient in this form, the socket should be divided vertically and opened and closed by set screws at each end dispensing with the hinge.

The object in making the stationary box funnel shaped at both ends is to reduce the width of the bearing where the cutter is inserted so as to permit a crooked or sweeping treenail to have a circular sweep as it passes through the throat, or bearing, of the box, by which it will be made to have a round form throughout its whole length (except the head) the required diameter of the hole into which it is to be inserted without cutting across the grain of the wood, which the cutter would do if the box were made the same diameter throughout its entire length, and which would injure such treenails very materially. This was a serious evil in our first machine. In making treenails by hand which is the mode now practised the maker does not interfere with the longitudinal curvature of the treenail, it being brought straight when driven into the side of the vessel. The object in separating or dividing the box at the center or middle of its diameter is to be able to vary the size of the treenail by starting the set screws. When the set screws are turned to the left the size of the treenail will be increased. When they are turned to the right an opposite effect is produced. In boring a ship with holes for the reception of the treenails the mechanic may commence boring in the

morning with a new auger and by sunset it will be found to be nearly one sixteenth of an inch smaller in diameter than it was at the commencement. Hence the necessity of varying the size of the treenail accordingly, which this machine does by simply turning the set screws and bringing the cutter nearer the center.

An essential quality possessed by this machine is that of making the treenail the required length by having the pinion made as long as the required treenail and giving it a tapering point by means of the sliding box at the outer end of stationary cutter box, having a cutter in it to point the treenail and a central pivot to arrest the farther entrance into the sliding box containing the said pointing cutter the box then sliding back with the treenail as it passes through the combined truncated box of the stationary cutter.

This machine is designed to be operated, generally, by hand power, but may be operated by any convenient and adequate power. It is placed in the ship yard so that the ship builders can make the treenails as they wish to use them and so that he can at all times adjust the cutter of the stationary box to cut the treenail to correspond with the wear of the auger in boring the ship.

With an ordinary machine a man can turn from one thousand to fifteen hundred per day taking them from the square as they are split from the block, turning them off to a cylindrical form, while by the old mode of making them by hand a man makes a much less number and very imperfectly, not cylindrical, but rather of a polygonal form, and not corresponding with the auger holes in the sides of the vessel designed to receive them.

What we claim as our invention and desire to secure by Letters Patent is—

The combination of the revolving pinion socket K, the stationary double trumpet mouthed socket L, and gouge shaped cutter M, with the sliding socket P, and beveled cutter R constructed, arranged, and operated in the manner and for the purpose above described and set forth.

ELBRIDGE WEBBER.  
NATHAN O. MITCHELL.

Signed in our presence:

NATHL. M. WHITMORE,  
LORENZO CLAY.