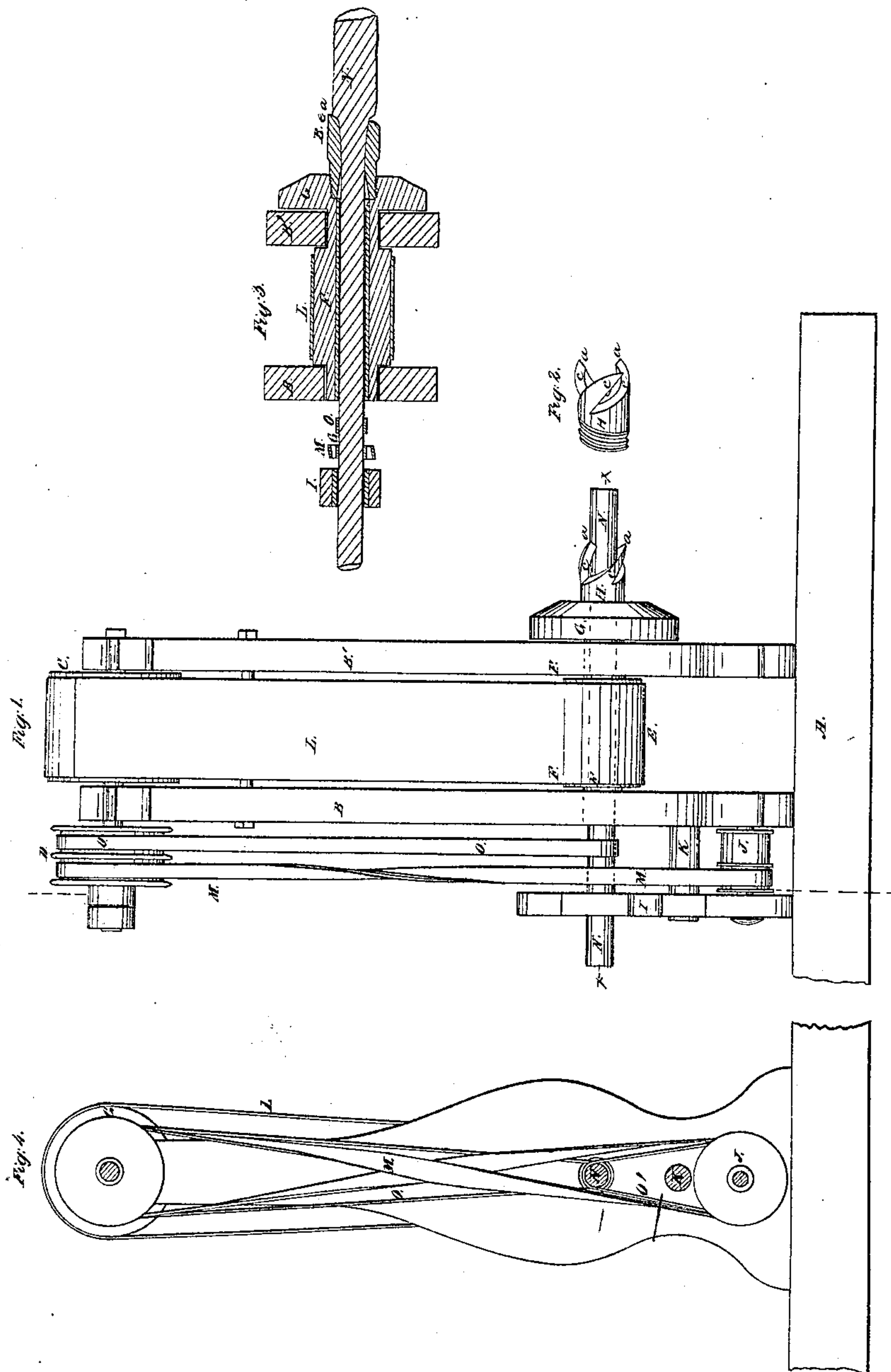


B. J. Tayman,

Polishing Wood.

No. 8,990.

Patented June 1, 1852.



UNITED STATES PATENT OFFICE.

BENJAMIN J. TAYMAN, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR TURNING AND POLISHING.

Specification of Letters Patent No. 8,990, dated June 1, 1852.

To all whom it may concern:

Be it known that I, BENJAMIN J. TAYMAN, of the city and county of Philadelphia and State of Pennsylvania, have invented
5 certain new and useful Improvements in Machinery for Turning and Polishing Wood and other Materials; and I do hereby declare that the following is a full, clear,
10 and exact description of my said invention, reference being had to the accompanying drawing, which forms part of this specification, and in which—

Figure 1 represents a side elevation of my cutting and polishing machine, Fig. 2 is a
15 view in perspective of one of the cutters, Fig. 3 is a horizontal section of the machine at the line x, x of Fig. 1 and Fig. 4 is a vertical section of the machine at the line $\# \#$ of Fig. 1.

20 The first part of my invention consists of a revolving tubular saw or serrated tool of peculiar construction for reducing oblong rough sticks to cylindrical rods by turning off the surplus wood in such manner as to
25 leave a smooth straight core of the required diameter.

The second part of my invention consists of a peculiar arrangement of polishing belts which encircle the cylinder and act equally
30 upon every part of its periphery, and therefore do not tend to flatten it like polishing belts which move tangentially to the surface upon which they are acting.

The third part of my invention relates to
35 the method of holding the rod from turning under the action of the cutter, and it consists in encircling it by two or more polishing belts moving in opposite directions, and with equal forces which being opposite neutralize one another, and hold the rod still
40 and with a firm grip.

The machine represented in the accompanying drawing is adapted to the formation of cylindrical articles such for example
45 as penholders, pencil stocks, and curtain rods, from irregular oblong pieces of wood, and to the polishing of their cylindrical surface. It consists mainly of two parts—viz—that which shapes the articles to a cylindrical form and that which effects the polishing
50 of their cylindrical surface and these two parts of the machine act in this instance in conjunction so that a polished cylindrical article is produced from a rough
55 stick by a single passage through the machine.

The frame by which the several parts of the machine are supported and maintained in their proper relative positions is composed of a base A and three upright standards B, B', I, which are secured to the base and are
60 also connected with each other by cross ties K, K. Two of these standards B, B', are higher than the third, I, and are fitted at their upper extremities with bearings in
65 which a driving shaft is supported. These standards are also fitted near the base with bearings which support the journals of a hollow mandrel, F, to the outer extremity of
70 which the cutter, H, is secured. The hollow mandrel, F, and the driving shaft above are parallel with each other and are fitted with pulleys to which a driving belt, L, is applied.

The polishing apparatus is contained between one of the larger standards, B, and
75 the shorter one, I; it consists mainly of two belts, O, O', Fig. 4 whose inner surfaces are coated in a manner similar to that of sand paper, with a composition of glass, emery, sand, or other polishing material; one of
80 these belts depends from a pulley secured to the driving shaft, and is of sufficient length to pass around the lower side of a cylindrical rod issuing from the hollow mandrel and
85 passing through a guide aperture made through the standard I in the line of the axis of the mandrel. The other polishing belt, O', extends upward from a pulley, J, secured to a countershaft beneath, and is of
90 sufficient length to pass around the upper side of the rod issuing from the mandrel. The upper belt, O, is driven by the driving shaft in the same direction as the belt, L, which drives the hollow mandrel, and therefore
95 tends to turn the article upon which it is acting in the same direction as the hollow mandrel. The lower polishing belt, O', is driven by the countershaft, which in turn is driven from the driving shaft by means of a
100 cross belt M encircling pulleys secured to the respective shafts, and consequently this lower polishing belt is driven in a direction the reverse of that in which the upper belt is moving, and thus counteracts its tendency
105 to turn the article issuing from the hollow mandrel which both belts encircle and by thus tending to turn it in opposite directions hold it steadily and with a firm grip either in one position or turning so slowly as not
110 materially to affect the action of the cutter.

The exterior of the tubular cutter may be

of any convenient or suitable form, but its interior must have the shape of two frustra of cones or conoids united at their smaller ends. One end of the tube is cut into a series
 5 of narrow spiral teeth, each of which has a cutting edge coincident with the conical inner surface of the tube and extending to the line where the conical surfaces of the opposite ends of the tube meet; the series of cutting
 10 teeth thus shaped and arranged operate upon the wood with a drawing cut, and form a kind of bell mouth that will receive and reduce a rough stick considerably larger in diameter than the rod to be produced.
 15 That portion of the tube behind the teeth will give sufficient support to the rod to prevent any great amount of vibration under the action of the teeth and at the same time in consequence of its conical shape, it will al-
 20 low the fine chips and dust to escape freely, so that there will be no danger of the rod binding in it.

When this machine is to be used a cylindrical rod of wood of the size of the rods
 25 about to made, should be inserted through the eye or guide aperture in the short standard outside of the belts, through the bights of the two polishing belts O, O', and into the hinder extremity of the hollow mandrel; motion is then imparted to the driving shaft,
 30 through the intervention of a belt, which runs upon a fast pulley, P, secured thereto, or in some other convenient manner by means of which the polishing belts and the
 35 cutter are respectively caused to move in the directions of the arrows, e, e, e. The blanks or rough sticks of which the cylindrical articles are to be formed and which may be prepared previously by sawing or
 40 otherwise, are introduced endwise and one at a time into the toothed extremity of the mandrel; as the first one enters the cutter, the teeth in their revolution remove the surplus material and reduce it to a cylindrical
 45 form. As fast as this operation is effected the blank is shoved onward through the mandrel; in this movement its inner end strikes the extremity of the article previously inserted between the belts, and eject-
 50 ing it from the machine, follows it through the bights of the polishing belts which smooth and polish its cylindrical surface, pushing the piece before it through the eye whence it is discharged. As fast as the
 55 rear end of one piece nears the edges of the cutter, the front end of the succeeding blank is applied to it to force it onward through the machine and to be in turn acted upon by the cutter and the polishing belts. As
 60 the space within the cutter back of the teeth is conical, and is smaller at the base of the cutting teeth than at any other part, there is no tendency in the tool to bind upon any considerable portion of the cylindrical sur-

face of the article, and consequently the 65 friction caused by such rubbing or binding is very inconsiderable and the great amount of power that would be consumed in overcoming such friction, if large surfaces were in contact, in a machine running at the very 70 high velocity at which this must run to make smooth work, is saved. Ample space is also given between the cutters for the escape of the shavings which therefore do not tend to clog the machine or heat the cutters 75 and draw their temper. From these causes the cutter has but little tendency to cause the material upon which it is acting to turn with it, except what results from the removal of the shaving, and this if not wholly 80 is in great part counteracted by the polishing belts as soon as the rod begins to pass between them. From these peculiarities of the machine the employment of grooved rolls or other analogous devices to keep the 85 sticks from turning while being fed may be dispensed with. The movement of the two polishing belts in opposite directions is also attended with another advantage; the arti-
 90 cle in moving through them tends to deflect them slightly in the same direction in which it is moving, and as they run in opposite directions, the grooves produced by the action of the polishing material of one belt will be crossed by those produced by that of 95 the other; and consequently the resulting surface will not only be more uniform but the operation will also be effected in a shorter space of time.

Having thus described my improvements 100 in machines for turning cylindrical rods what I claim therein as new and desire to secure by Letters Patent is—

1. The arrangement of a polishing belt for polishing circular surfaces in such man- 105 ner that a bight of it shall pass around the article to be polished and move concentrically or nearly so to the surface thereof, so as to finish the same rapidly and without the danger of making flat places in its pe- 110 riphery which is always so imminent when a round article is polished by bringing it in contact with a polishing surface moving in a straight line.

2. I likewise claim the combination of 115 the rotating tubular cutter for turning the rod with the polishing belts which while polishing one end of the rod grasp it firmly and hold it from turning while its other end is under the action of the cutters as herein 120 set forth.

In testimony whereof I have hereunto subscribed my name.

BENJ. J. TAYMAN.

Witnesses:

P. H. WATSON,
 JOHN L. SMITH.