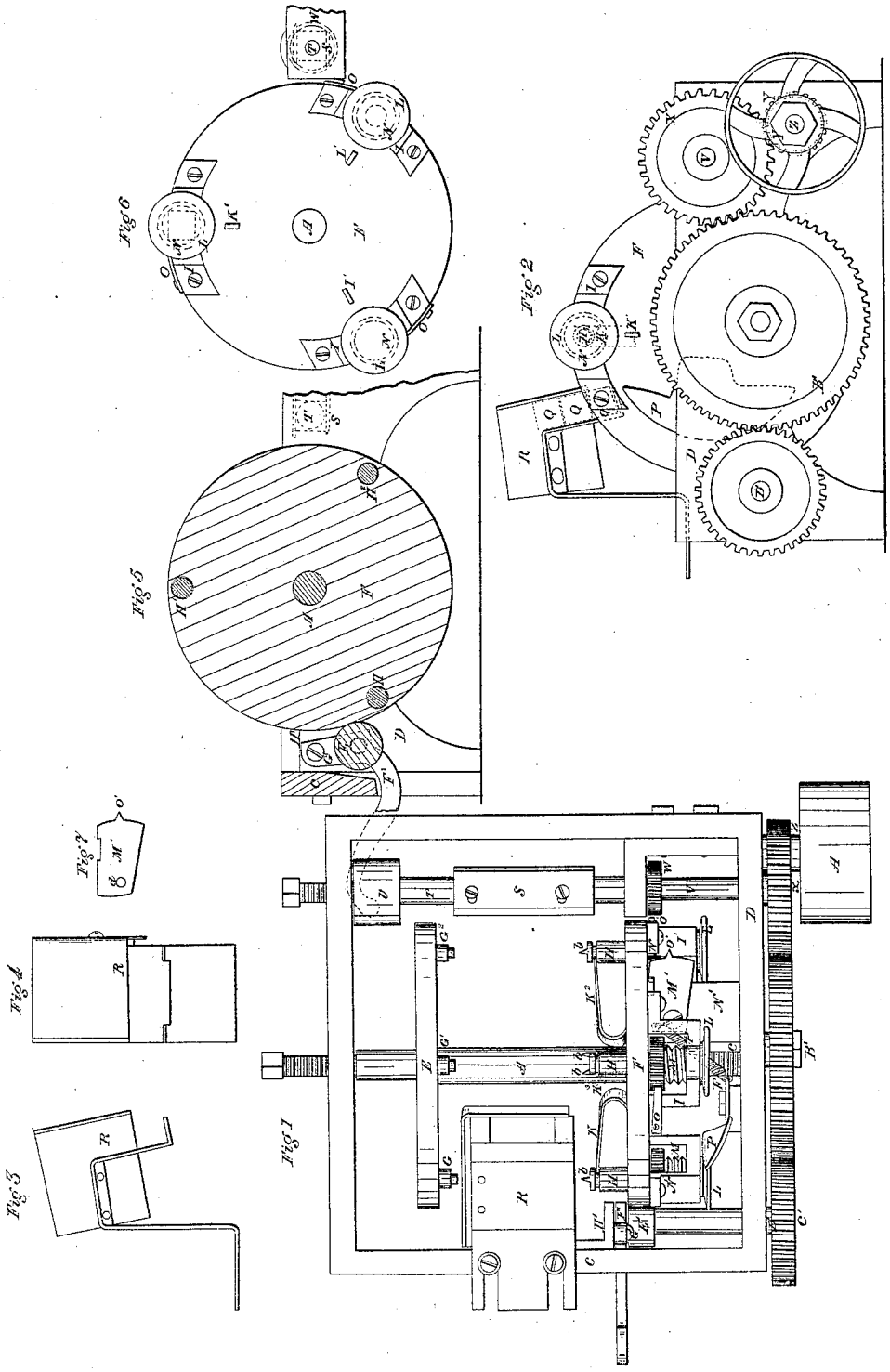
I. S. Waite,

Turning Regular Forms.

No. 10,193. Patented Nov. 1, 1853.



UNITED STATES PATENT OFFICE.

INCREASE S. WAITE, OF HUBBARDSTON, MASSACHUSETTS.

MACHINE FOR TURNING CYLINDERS OF WOOD.

Specification of Letters Patent No. 10,193, dated November 1, 1853.

To all whom it may concern:

Be it known that I, INCREASE S. WAITE, of Hubbardston, in the county of Worcester and State of Massachusetts, have invented a new and useful Machine for Turning Cylinders or Various other Articles of Wood; and I do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, letters, figures, and references thereof.

Of the said drawings, Figure 1 represents a top view of my said machine. Fig. 2, a side elevation of it.

In the said drawings A represents a horizontal shaft supported by suitable bearings or pivots, B, C, that are sustained in position by a proper frame, D. This shaft carries two circular heads E, F, which are fixed upon it at a proper distance apart and parallel to each other, each being at right angles to the shaft. One of these heads, viz., E, has a series of centers G, G′, G², or pivots projecting from its inner side and near its periphery and at equal distances apart from one another, and respectively in line with a similar number of mandrels G, G′, G², H, H′, H², applied to the other head F and each made to freely rotate like the arbor of a lathe, and be capable of sliding through the plate in a longitudinal direction. Each of these mandrels is sustained by the circular head F, and a metallic support piece I, shaped and attached to the head as seen in the drawings. To each mandrel, and to the head a spring K, K³, or K², is applied, the spring being attached at one end to the head, and being forked at its other end, and made to work or extend into a groove *a*, cut around in the front part of the mandrel. On the opposite end of each of the mandrels is a wheel L, and each mandrel has a screw M and a gear N fixed upon it, as seen in the drawings, the said gear having a retaining spring pawl O, applied to it and the head.

On the inner side of the frame D and within the path of rotation of the wheel L is an inclined cam plate P, shaped as seen in the drawings, and so arranged as to act against the inner side of the wheel L of each mandrel and force the mandrel backward so as to relieve the turned article from it, and move it back a sufficient distance for it to receive and grasp a piece of wood to be turned. The several pieces of wood to be turned in succession are seen at Q, Q, Q, as placed within a box or hopper R. The said hopper is arranged as seen in the drawings, and is made as represented in Figs. 3 and 4, which respectively are side and front views of it, it being made so open at the lower part of its front side and at its end as to allow the lowermost of the pieces of wood Q, Q, to remove from it by the action of one of the mandrels and the center G, G′, or G² thereof, while the rotary heads E, F, are in revolution. The hopper should be so arranged that at the moment the wheel L passes entirely beyond the upper end of the cam P, the axis of the lowest piece of wood Q should be in line with the axis of one of the mandrels and one of its centers G, G′, or G², for at such time the mandrel is released from the cam and is thrown forward by the action of its spring. The spring advances it toward and against the piece of wood so as to cause it not only to smartly move the piece of wood against the center G or G′, but to fix the mandrel to the wood, the inner end of the mandrel being provided with spurs *b*, *b*, such as will so fasten the mandrel to the woods as to cause the wood to turn with the mandrel when the latter is put in revolution.

A rotating cutter wheel or cylinder (as it is sometimes termed,) is placed on a horizontal shaft T, which is disposed with respect to the heads, E, F, as seen in the drawings. This cutter wheel may be formed or have the edges of its cutters so formed as to render it capable of turning a piece of wood in a cylindrical shape or in any other shape which in transverse section is circular, as a piano-forte leg for instance. This shaft T is put in rotation by means of a belt from any suitable driving power made to pass over a pulley U, fixed on the said shaft. Nearly in line with the shaft T is another shaft V, arranged as seen in Fig. 1, and having a gear W, fixed on its inner end as shown in said figure, such gear being made to match with the gear N, hereinbefore mentioned, and to engage with said gear and put it in rotation when the two are brought into contact.

The shaft V of the gear W receives its motion by means of a gear X, fixed upon its outer end, and made to engage with a pinion gear Y, fixed on a driving shaft Z, put in rotation by a band made to work over a driving pulley A′, fixed on the said shaft.

The gear X engages with a gear B′, which is made to convey motion to or engage with another gear C′, fixed upon a shaft D′, arranged as seen in Figs. 1 and 2. On the said shaft D′ there is a friction roller or wheel E′, whose periphery is borne up against the periphery of the circular head F, by means of a weighted lever F′.

Fig. 5 is a vertical section taken through the head F, the roller E′, and exhibits the lever F′, its fulcrum and supporting strut. The inner end of the shaft D′ turns in the said lever, while the upper end of the lever is supported on a fulcrum G′, extended from a strut H′, that is projected from the cross bar of the frame D, as seen in Figs. 1 and 5.

In Fig. 6, I have exhibited an external side view of the head E, and its appurtenances, which head is provided as seen in the drawings with studs I′, K′, L′, each of which is placed near to some one of the mandrels, there being a stud to each mandrel and such stud being so situated with regard to it as to come in contact with a stop plate M′ and stop the rotation of the heads E, F, when the mandrel is carried into a suitable position, for the rotary cutter wheel S to operate on the wood held by it. This stop-plate (a top view of which is represented in Fig. 7) turns on a fulcrum pin *d*, screwed into the top surface of a tubular arm N. The front end of this stop plate, or that which has a small projection O′, extended from it, is forced toward the head F by a spring P′. (See Fig. 1). This projection O′ extends between the threads of the screw N, and consequently when the mandrel is put in revolution, such screw will cause the stop-plate M′ to be turned or moved laterally until it passes from under the stud I′, K′, or L′, that may be resting on it, and so as to remove all hindrance to the further rotary movement of the shaft A and its heads. Now during the time that such stop plate is being so moved, the mandrel is being rotated by the gear W, which engages with and turns the gear N of said mandrel. Thus is effected the rotation of the block of wood which is to be turned, such rotation taking place while the cutter wheel is in operation on it. As soon as the stop plate M′ passes from under the stud as described, the shaft A will be put in rotation by the action of the friction roller E′ against the periphery of the head F. This takes away from the cutter S the piece of wood that has just been turned and brings up to or carries toward the said cutter another piece of wood to be turned, which latter piece has been seized by a mandrel and its center and removed from the hopper. As soon as said piece is removed from the hopper, the whole number of pieces within the hopper fall downward and dispose themselves so that when the next mandrel comes up to the lower one, it will seize and remove it in a similar manner. When a mandrel holding a piece of wood is retracted or pulled backward by the cam plate P, the wood will drop out of the machine. Thus pieces of wood may be successively operated upon or taken from the hopper and turned and discharged from the machine.

Having thus described my invention, what I claim is as follows:

I claim the combination composed of the feeding hopper, the series of rotary mandrels and centers applied to the shaft A, the revolving cutter or cutter cylinder S, mechanism for giving to each mandrel an endwise movement, backward and forward as described, mechanism for arresting the rotary movement of the shaft A, or the heads E, F, during the time necessary for the operation of the cutter or cutter wheel S, on each piece of wood, and finally a mechanism for rotating the shaft A and its two heads all substantially as above described; the mechanism for moving each mandrel endwise in manner and for the purpose described, being the spring K, the wheel L, and cam plate P, as described, that for rotating the mandrel, being the gear N and the gear W on the shaft Y, put in revolution as described; that for arresting the rotation of the shaft A during the time necessary to turn down an article being the studs I′, K′, or L′, stop plate M′, and the screw applied to each mandrel and made to operate as specified; and finally, that for rotating the shaft A, being the friction roller F′, made to operate against the periphery of the circular head F and to be rotated and borne against said head substantially as herein before set forth.

In testimony whereof I have hereto set my signature this eleventh day of April, A. D. 1853.

INCREASE S. WAITE.

Witnesses:

GEORGE KENDALL,

EDWARD KENDALL.