

(No Model.)

3 Sheets—Sheet 1.

H. C. TUNIS.
PLANING MACHINE.

No. 302,874.

Patented July 29, 1884.

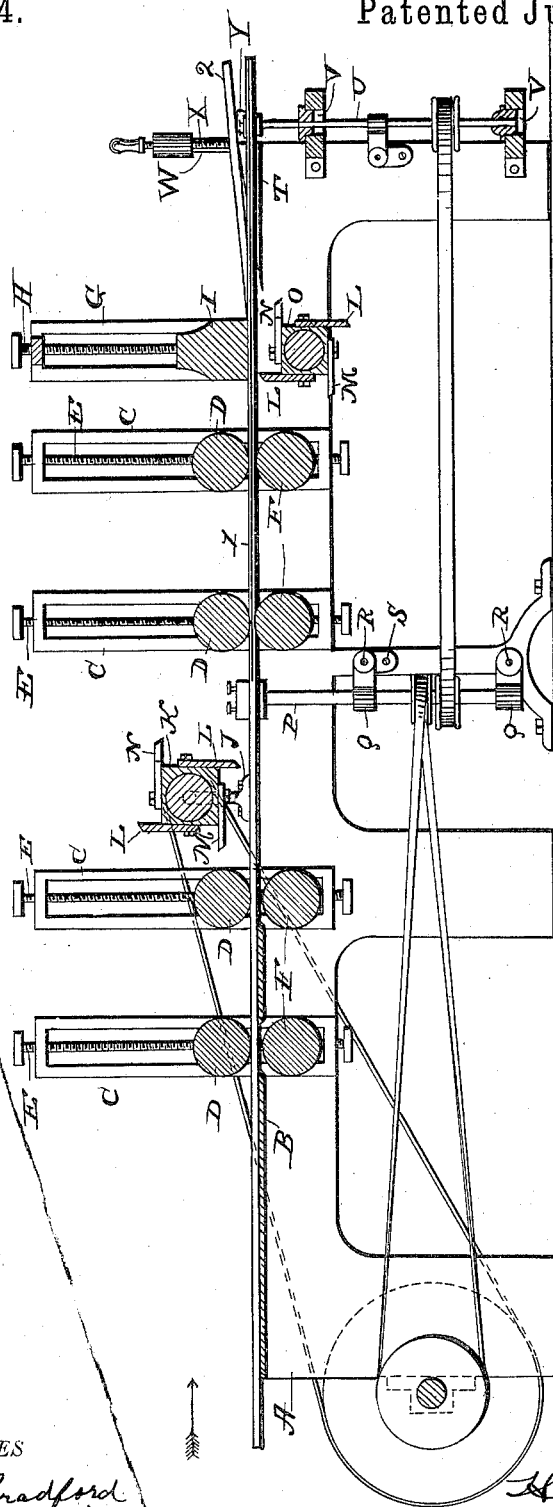


Fig. 1.

WITNESSES

Edwin L. Bradford
James M. Durant.

INVENTOR

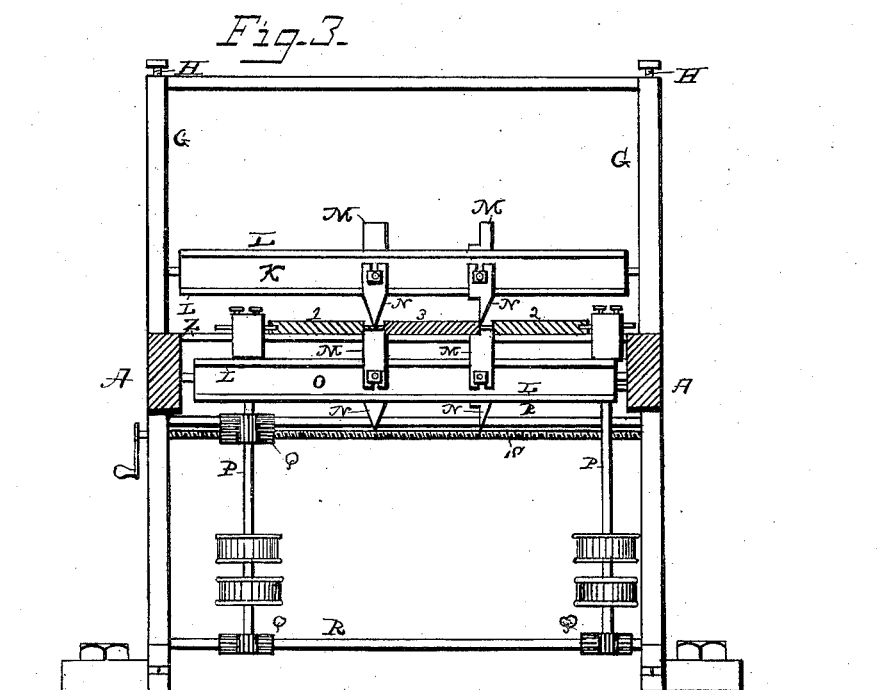
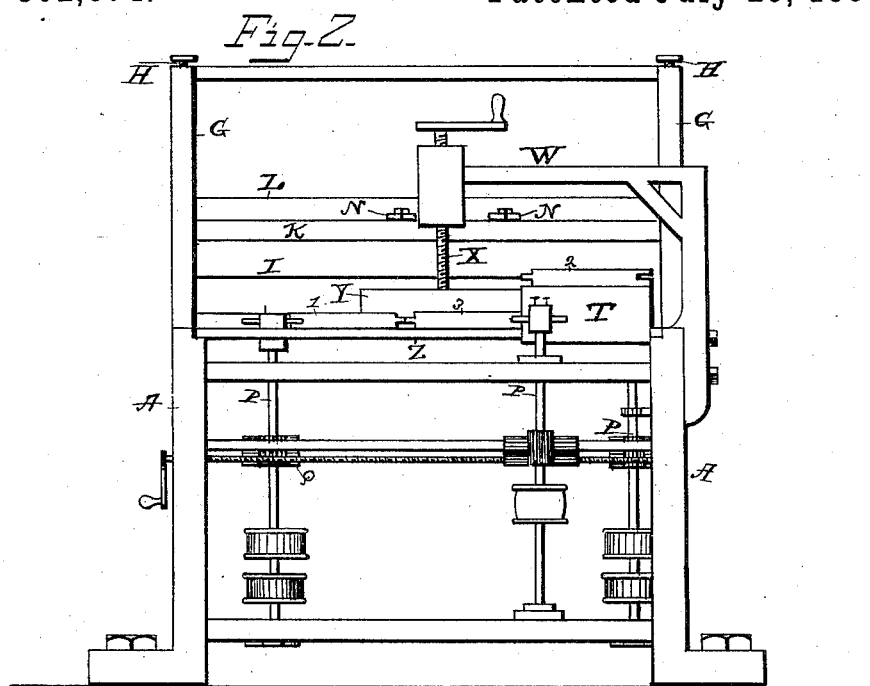
Henry C. Tunis.

By Paulmin & Semmes
Attorneys.

H. C. TUNIS.
PLANING MACHINE.

No. 302,874.

Patented July 29, 1884.



WITNESSES

Edwin L. Bradford
James M. Durant.

INVENTOR

Henry C. Tunis
By Toulmin & Gemmes,
Attorneys.

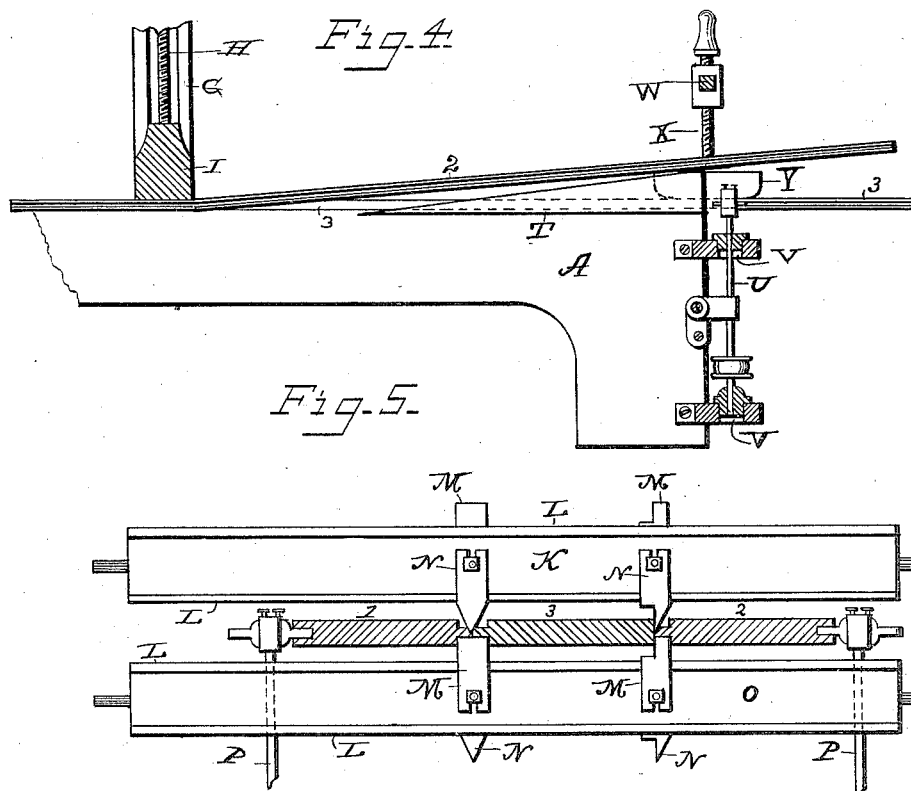
(No Model.)

3 Sheets—Sheet 3.

H. C. TUNIS.
PLANING MACHINE.

No. 302,874.

Patented July 29, 1884.



WITNESSES

Edwin L. Bradford
James H. Durant.

INVENTOR

Henry C. Tunis.
By Toulmin & Gummey,
Attorneys.

UNITED STATES PATENT OFFICE.

HENRY C. TUNIS, OF BALTIMORE, MARYLAND.

PLANING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 302,874, dated July 29, 1884.

Application filed May 13, 1884. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. TUNIS, a citizen of the United States, residing at Baltimore, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Planing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful improvements in machines for planing, tonguing, and grooving boards at one operation; and it has for its objects, first, to provide a plurality of revolving cutter-heads
15 with blades which shall act to dress the stock on both sides, to form tongues thereon, and to sever the same as the stock is fed through the machine without any waste of the stock; second, to provide means whereby access may
20 be had to the intermediate edge of a board for the purpose of grooving the same, yet without waste; third, to provide improved cutting-blades of such character as to form deep grooves in the upper and lower surfaces
25 of the stock, leaving an intermediate portion of the material to constitute the tongues; and, fourth, to provide blades which shall act on the intermediate portion of material which is left so as to sever it, and at the same time
30 form the proper finish to the edges of the tongues.

In the accompanying drawings, forming a part of this specification, and on which like letters of reference indicate the same or corresponding features, Figure 1 represents a longitudinal vertical sectional view taken through
35 my improved machine; Fig. 2, an end view thereof looking toward the tail; Fig. 3, a transverse sectional view of the same; Fig. 4, a longitudinal sectional view on an enlarged scale, showing the devices for varying the planes of the boards and for cutting the groove; and Fig. 5, a detached side elevation of the horizontal cutter-heads carrying the planing,
40 grooving, and tonguing blades.

The letter A designates the frame-work of my improved machine, the same being preferably constructed of iron and of any desired shape, a bed, B, being attached thereto and
50 extended from the front to the second pair of feed-rollers. A series of roller journal-frames,

C, are attached to the respective sides of the frame, and are provided with suitable journal-boxes, in which fit the journals of the feed or pressure rollers D. These rollers are capable of vertical adjustment by means of the
55 screw-threaded rods E.

Beneath the upper surface of the frame A, and in proximity with the respective rollers D, are a corresponding series of pressure or
60 feed rollers, F, which are mounted and adjusted in the manner above described.

Located near the rear end or tail of the machine are frames G, similar to the frames C, in which is adjustably mounted, through the
65 medium of suitable journal-boxes and the adjusting-rods H, a transverse pressure-bar, I, the lower surface of which is smooth, so as to permit the boards to pass thereunder.

Located in suitable standards, J, secured to the frame of the machine is a transverse horizontal revolving shaft, K, the sides of which are preferably rectangular with each other. Secured to the said shaft, and on diametrical
70 sides thereof, are the planing-blades L, the shanks of which are provided each with a slot, by means of which they are firmly connected with the shaft and are capable of being adjusted so as to vary the depth of their cut. The intermediate sides of the shaft K
75 are supplied, respectively, with a series of tonguing-blades, M, and parting-blades N, the shanks of which are also provided with slots; whereby, through the medium of bolts and nuts, they may be detachably and
80 adjustably connected with said shaft. The blades M are set slightly beyond the circle described by the rotation of the planing-blades, whereby they are made to take somewhat deeper into the stock to be acted upon, and
85 the blades N are in turn adjusted slightly beyond the circle described by the blades M, whereby they, too, in turn are made to take somewhat deeper into the stock.

Mounted in suitable bearings in the frame A, I provide a further transverse horizontal revolving shaft, O, and to diametrical sides of which are attached, in the manner above described, the planing-blades L, and to the intermediate diametrical sides are also similarly attached
90 grooving and parting blades, respectively. The location of this shaft, it will be observed,

is below the plane occupied by the shaft K, or beneath the passage in which the stock travels through the machine, said shafts being also located consecutively or one beyond the other in the direction in which the stock travels. The object of this arrangement is to dress both sides of the stock, also to tongue the same on its opposite sides, by merely passing it through the machine once, as will be presently described.

At a convenient point alongside the sides of the machine are mounted the shafts P, carrying suitable grooving-tools in their heads, which may be secured therein by screws, or in any other convenient manner. One of these shafts is mounted, as seen in Fig. 3, in suitable bearings extending from one side piece of the frame, and its grooving-blades are adapted to engage the adjacent edge of the stock against which they are rotated as it is fed through the machine. The other of these shafts P is mounted in sliding boxes Q, which fit over the transverse rods R, the upper of said blocks having an extension provided with a female screw-thread, through which is passed the correspondingly-threaded shaft S. This shaft is also mounted in the frame of the machine, and is provided at one end with a crank, whereby the shaft P may be adjusted to bring the grooving-knives up to the adjacent outer edge of the stock according to the width of the same. These shafts are each provided with pulleys over which suitable belts are designed to be placed in order to give them the required rotary motion. Thus it will be observed that the grooves on the opposite or outer edges of the stock are formed by the grooving cutters or blades just described.

It will be seen from Figs. 3 and 5 that the stock is being formed into three boards, the outer ones, or those designated as 1 and 2, being provided each with a tongue by the action of the blades M, and with grooves on their outer edges by the grooving-cutters just described. The board designated by number 3, however, while provided with a tongue on one side, is not, by the operation just described, provided with a groove on its opposite edge. It is a material feature of my invention to accomplish this end, for doing which I provide the machine with an inclined plane, T, located so as to elevate the board adjacent to the untouched edge of the one to be grooved as the stock is forced through the machine, the parting-blades having effected a separation between it and the adjacent board before it reaches this point. This inclined plane T is secured to the machine proper; and it consists, essentially, of a block or piece, preferably of metal, secured to the frame of the machine with its point or lower part of the incline in the direction from which the stock is fed. As the stock passes through the machine, after it has been separated into boards by the parting-blades, one of such boards, coming in contact with the incline, rides along over and above it, thereby effecting the separation of such board from the board the edge of which is to be grooved, as above stated.

ration of such board from the board the edge of which is to be grooved, as above stated.

Near or at the tail of the machine I mount a shaft, U, in suitable blocks fitted in transverse slots in the cross-pieces V. These pieces are preferably secured to the frame of the machine, and, in order to adjust the shaft to and from the edge of the board, I provide an arrangement like that just described for adjusting transversely the shaft P.

Mounted upon one side of the machine is an arm or bracket, W, the horizontal arm of which extends over the bed of the machine.

Fitted within an interiorly-screw-threaded head on the end of the frame is a correspondingly screw-threaded shaft, X, to the lower end of which is attached a shoe or presser-foot, Y, the forward and rear ends of which are slightly curved, as seen in Figs. 1 and 4, so as to prevent the board passing under the same from liability to be obstructed. The function of this presser-foot is to hold the boards firmly down upon the bed of the machine, a bed, Z, being provided at this point for the purpose of supporting the board while the grooving-tool is working. Thus it will be seen that the grooving-knives carried by the shaft U may be brought in contact with the edge of the board designated number 3, and thereby form a groove in the same, the elevation of the adjacent board above it allowing ample room, and at the same time avoiding such loss of material as would occur if the cutter had to force its way through and between the boards.

It is noticeable that one set of the tonguing-blades are flat across their cutting-edge, and are equal in width to the width of two tongues, while the parting-blades, which act in conjunction with these particular grooving-blades, have a V-shaped point. The other set of tonguing-blades are also flat across their cutting-edges, but are equal in width to the width of one tongue only, and the parting-blades, which act in conjunction with them, are straight on one side and tapered on the other. Thus it will be seen that the first set of tonguing-blades, or those nearest the left, as seen in Fig. 5, act to cut away the stock from both sides, while the coacting parting-blades merely part or sever the tongues after being thus formed, their double taper giving the proper finish to the edges of the respective tongues. On the other hand, the other set of planing-blades merely forms one tongue, yet acting on both sides of the board, and their coacting parting-blades sever the tongue thus formed from the adjoining board, at the same time giving the proper finish to the edge of such tongue. The tonguing-blades may be provided with short cutting-points, so as to do the work of the pointed parting-blades; but such form of blade would be objectionable, in that such points would wear off more rapidly than the remaining portion of the blades, and thereby create an inequality in the depth of the cut of the respective portions of such blade. For

this reason I have made the tonguing and parting blades separate, and also adjustable on the shafts, so that if the pointed blades wear off more rapidly than the flat blades they may be radially adjusted to compensate therefor.

It is obvious that some other means of elevating or separating one board above or from the other may be adopted, and I therefore do not confine myself to the inclined plane shown and described.

It is obvious that several of the shafts U, which carry the grooved cutting blades or knives, may be placed at different intervals across the machine, so as to form grooves in several of the intermediate boards, when more than three are being cut from a single piece of stock, without departing from the spirit of my invention. A corresponding number of inclined planes would also be used in connection with this arrangement.

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

1. In a machine for planing, tonguing, and grooving boards, the combination, with the frame thereof and suitable feed-rollers, of the shafts carrying, respectively, the planing, the flat tonguing, and V-shaped parting blades, the said shafts being located in consecutive order and on opposite sides of the passage of the stock.

2. In a machine for planing, tonguing, and grooving boards, the combination, with a suitable frame, of the shafts carrying the planing, tonguing, and parting blades, the shafts being located in consecutive order and on opposite sides of the passage of the stock, the grooving-blades, and a device to separate the boards, so that one of said grooving-cutters can act upon an intermediate edge of the stock or of a board.

3. In a machine for planing, tonguing, and grooving boards, the combination, with a suitable frame, of the shafts carrying planing, tonguing, and parting blades, the said shafts being located in consecutive order and on opposite sides of the passage of the stock, the grooving-blades, and the inclined plane adapted to act on the stock, so as to separate the boards and allow access to the intermediate edge thereof by said grooving-blades.

4. In a machine for planing, tonguing, and grooving boards, the combination, with the grooving knives or blades, of a device constructed to separate the boards, whereby access to an intermediate edge may be had by said grooving-blades.

5. In a machine for planing, tonguing, and grooving boards, the combination, with the intermediate revolving grooving-blades, of the inclined plane located in advance of said blades to elevate one of the boards, whereby access to the inner edge of the adjacent board may be had by said grooving-blades.

6. In a machine for planing, tonguing, and grooving boards, the combination, with the intermediate grooving-blades and the inclined plane located in advance of said blades for elevating one of the boards, of the presser foot or shoe, whereby the board being grooved may be firmly held.

7. In a machine for planing, tonguing, and grooving boards, the combination, with the frame thereof and the shafts carrying planing, tonguing, and parting blades, of the grooving-blades located at each side thereof, the grooving-blades located intermediate the sides, the inclined plane for varying the plane of the boards, located in advance of said grooving-blades, and the shoe for holding the intermediate board down to its place while being grooved.

8. In a machine for planing, tonguing, and grooving boards, the shaft provided with planing, tonguing, and parting blades, the tonguing and parting blades having flat and V-shaped cutting edges, respectively.

9. In a machine for planing, tonguing, and grooving boards, the shaft having the adjustable flat-edge tonguing-blades and the adjustable V-shaped parting-knives, the said tonguing and parting blades being on diametrical sides of the shaft.

10. In a machine for planing, tonguing, and grooving boards, the combination, with the shafts having, respectively, planing-blades, of a set of flat-edge tonguing-blades equal in width to two tongues, a set of V-shaped parting-blades, and a set of tonguing-blades equal in width to tongue, and a set of parting-blades having straight and tapering sides, each shaft being placed on opposite sides of the passage of the stock.

11. In a machine for planing, tonguing, and grooving boards, the parting-blades having straight and tapering sides to their cutting-edges.

12. In a machine for planing, tonguing, and grooving boards, the parting-blades having V-shaped cutting-edges.

13. In a machine for planing, tonguing, and grooving boards, the combination, with the inclined plane for separating the boards, of the adjustable presser-foot for firmly holding the board while being grooved.

14. In a machine for grooving boards, the combination therewith of a board-separator constructed and located to separate the boards as they pass through the machine, whereby access may be had to the edge of an intermediate board by a grooving-blade.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY C. TUNIS.

Witnesses:

ROBINSON WHITE,
JAMES M. DURANT.