R. R. Throckmorton.

Sawing & Planing Mach.

No. 4,017. Patented May 1, 1845.

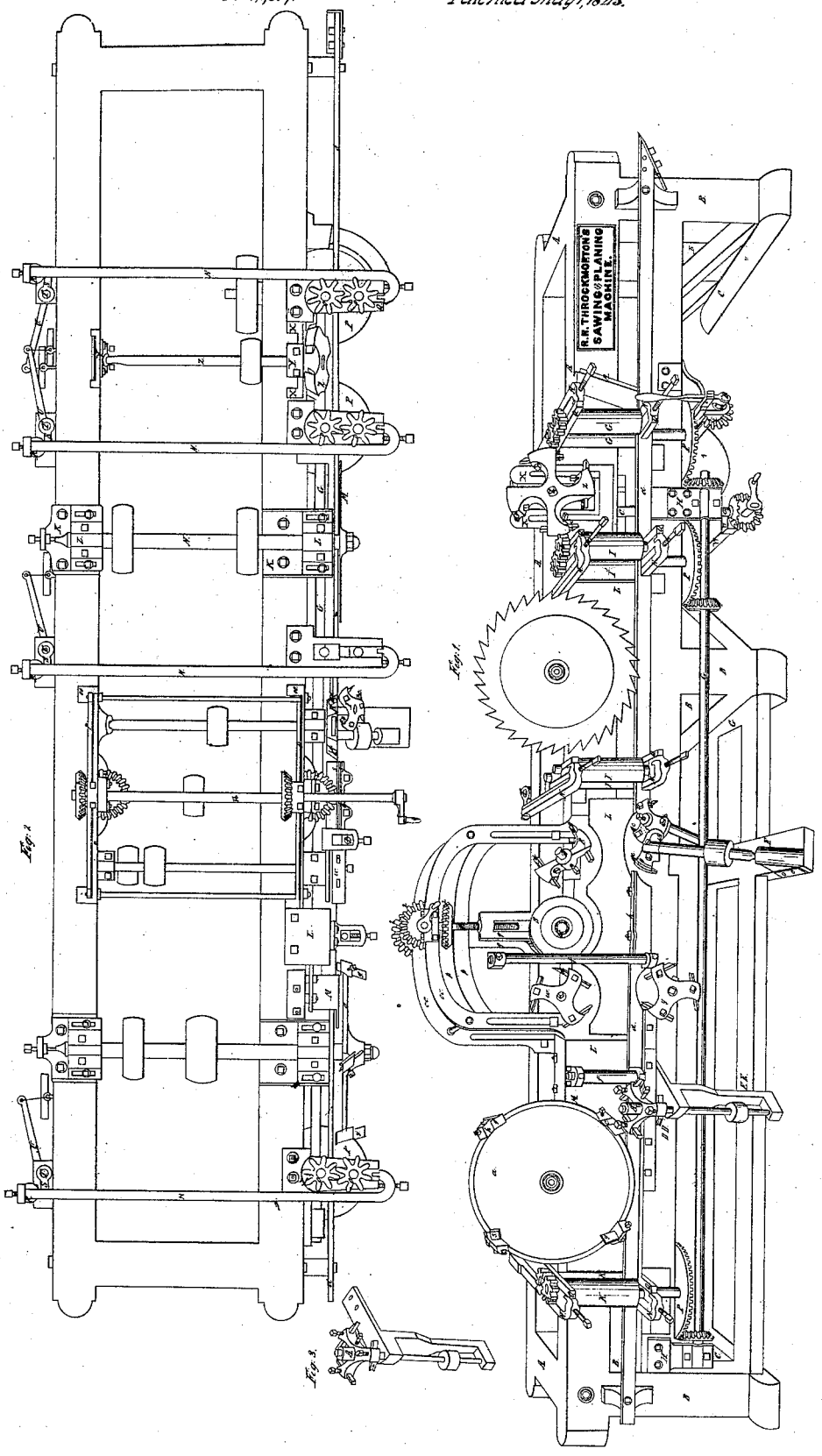

Fig. 1.

Fig. 2.

Fig. 3.

UNITED STATES PATENT OFFICE.

REID R. THROCKMORTON, OF BROOKLYN, NEW YORK.

MACHINE FOR PLANING, TONGUING AND GROOVING, RABBETING, AND BEADING PLANKS AND OTHER LUMBER.

Specification of Letters Patent No. 4,017, dated May 1, 1845.

To all whom it may concern:

Be it known that I, REID R. THROCKMORTON, of the city of Brooklyn, county of Kings, and State of New York, have invented a new and useful Machine for Planing, Sawing, Tonguing, Grooving, and Rabbeting Boards; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings of this specification, in which—

Figure 1 is a perspective view, and Fig. 2 is a ground plan.

The nature of my invention consists in making and applying a new machine, by new mechanical operations, to produce the planing, sawing, tonguing, grooving and rabbeting boards, plank, and other materials, by one operation on the same plank or board, or either one of these operations separately, by disconnecting the other parts. This I accomplish by the use of a circular veneer saw and cutters, or a number of them arranged as required and herein specified.

The following is a description of one size of machine, but they may be built of such sizes and proportions as occasion may require, viz: I construct my machine in the following manner: A A A A, Fig. 1, is a frame of wood or metal about twenty feet in length, and four feet wide, and three feet six inches high; standing on six legs, B B B B B B, Fig. 1, said frame to have two or more girths let into the top timbers crosswise, to brace said timbers. Underneath the top timbers, and about eighteen inches from the top of frame, is let in two other parallel pieces D D, Fig. 1, running the whole length of frame. The same kind of pieces is also let in running from the center leg to one end of said frame and about four inches from the floor E E, Fig. 1; those pieces to be of timber four by eight and on both sides of the frame. Underneath the legs there should be three feet C C C, Fig. 1, running crosswise the frame and the legs mortised into them to stiffen the legs. The timbers in said frame should not be less than seven or eight inches square, except the four parallel pieces above spoken of, with the narrow edges to the front of the frame; also a piece F, Fig. 1, to be let in on the bottom of parallel pieces crosswise the said frame. Said frame should have corner braces to run parallel with the timbers—that is to say, on the sides of frame. Into the top timbers and the ones underneath it, is let in eight roller stands Q, Q, Q, Q, Q, Q, Q, Q, Fig. 1, sufficient to receive eight rollers five or six inches diameter, with suitable boxes properly fitted to the stand, allowing the outside rollers to approach and recede from the rollers next to the frame, which must set the distance of their own diameter from the frame, with the boxes arranged so as to adjust them with set screws to a proper line, and true the rollers G, G, I, I, J, J, K, K, Fig. 1; to set vertical the outside ones, moving to and from the inside ones, so as to grip any thickness of plank or board. On the top of said rollers, are star cog wheels, O, O, O, O, O, O, Fig. 2, which connect them together so that one cannot turn without the other. On the inside rollers are fitted bevel cog wheels, P, P, P, Fig. 1, about eighteen inches diameter; on the end below the stand and timbers, into the first bevel wheel, is geared a six inch pinon E, Fig. 1, mounted on a short shaft D, Fig. 1, about three feet long, and one and a half inches diameter, this shaft running crosswise the machine, supported by hangers and boxes to the frame, said shaft to have a pinion E, Fig. 1, on each end of it, so that by pushing it either way the pinions will come in gear, and by giving motion to it, the feed rollers will start in motion, and by pulling it back again it will stop; by pulling it back still farther, it will move the rollers the reverse way, which will back the plank or board out of the machine; this shaft to be carried by a pulley about thirty inches diameter, on the inside end from the main drum, or other shafts of the machine. If from any shaft in high motion, it should be reduced by conical pulleys and an extra shaft, so as to decrease or increase the motion at pleasure, say the motion of the rollers from fifty to one hundred revolutions per minute more or less. In front of the frame, and underneath the center of the back rollers, is attached a connecting feed shaft G, Fig. 1, parallel with the frame and mounted in hanging boxes H, H, Fig. 1, fastened to frame with as many pinions I, I, I, Fig. 1, on it, as will connect all the back rollers. To the boxes of the outside rollers is attached a fulcrum bar to each N, N, N, N, N, N, N, N, Fig. 1, running crosswise the machine,

and extending beyond the timbers. In the outer end is a mortise or slot to receive a gib R, R, R, R, R, R, R, R, Fig. 2, and crank S, S, S, S, S, S, S, S, Fig. 2. In the end of the fulcrum bars are set screws for the purpose of setting the gib in or out, to shorten or lengthen the fulcrum bars to accommodate different thicknesses of stuff. The upper and lower cranks to each pair of the boxes, is mounted on the same shaft T, T, T, T, Fig. 2. To this shaft is attached a lever U, U, U, U, Fig. 2, and weight. This weight is attached by a cord and pulley; the shaft standing vertically, the outer end of the lever moving to and from the side of the frame, thus causing the outer rollers to compress the plank equal on both edges. There should be set screws in the end of the fulcrum bars next to the rollers also, so that the rollers shall not approach too near each other when the board is out. The advantage of this improvement, is that one end of the rollers cannot approach without the other end. Three pairs of these rollers will be sufficient to gear together in most machines, the other pair to keep the material steady through the machine. On the outer end of said short feed shaft already spoken of, there should be a deep groove or journal turned for the purpose of receiving the end of the starting bar, which should be made to slip into the journal with clutch springs to the end, of sufficient length to reach to the center of the shaft; this being fastened on a movable joint at a suitable distance, will work the short feed shaft backward and forward at pleasure. Next and in front of the first pair of rollers G G, Fig. 1, which is about four feet from the end of the frame, is placed a stationary knife A, Fig. 1, mounted on a cast iron bed piece, with bolts, nuts, and set screws, to push out the knife as it diminishes in width. The use of this knife, is for the purpose of taking off the stub shot that is generally on boards and plank.

The second pair of rollers I I, Fig. 1, must be set about two feet from the first. Between these two sets of rollers, are let in flush with the frame, two cast iron stands—X, X, Fig. 1, with slides. Into those slides are fitted two movable boxes Y, Y, Fig. 2, with regulating screws, C C, Fig. 1, running through a nut let in at the bottom end, and reaching below the frame to two cast iron hangers W W, Fig. 1. Attached to frame into those hangers is mounted a shaft W′, Fig. 1, about one and a half inches diameter, reaching from the face side of frame to the opposite one: this shaft having on two miter wheels V, V, Fig. 1, mounted one upon each end of those wheels, connecting with two of the same dimensions which are mounted on the lower ends of the regulating screws C C, Fig. 1. Thus by turning the cross shaft W′, Fig. 1, the movable boxes Y, Y, Fig. 2, will traverse up and down. Into those boxes is mounted a conical cutter and shaft Z, Z, Fig. 1. The cutter to be on an angle of about twenty two degrees. Thus it will be seen that one end of the shaft must be dropped down, so as to bring the cut of the tools at right angles with the face of the board: the lower end of said shaft running in a movable step 2, sliding at a proper angle with the shaft: the conical cutter head to be capable of receiving from four to eight two inch cutters *a a*, *a a* which are let in through a mortise and fastened with a set screw: said wheel to be about sixteen inches diameter. These are to reduce the boards to an even width instead of a saw, preparatory to being operated on by other parts of the machine: the regulating screws to have threads of one eighth of an inch, to the turn so as to bring the cutters up and down by half inches at a time—or more if you please—every four turns making half an inch.

Next to the second pair of rollers I I, Fig. 1, is a bed plate L, Fig. 1, of cast iron about fourteen inches wide, reaching from the top rail to the one beneath; cut out circular on one edge to suit the circle of the saw, and to set a little back from the line of the rollers, so as to allow the plank to come to the saw steadily, and when past the teeth of the saw, to be off the bedplate and clear from the saw. About three feet farther on the frame is a third set or pair of rollers, J, J, Fig. 1. Between the second and third pair, is mounted a circular veneer saw M, Fig. 1. To hang this saw, let in on both timbers two cradles, K K, Fig. 2, of cast iron, with chipping pieces on the bottom and edges—or sides—in order to dress them true for the reception of the L L, Fig. 2. On the outer end there should be a raised projection, for the insertion of a set screw for the purpose of pushing out the saw shaft: the boxes to be fitted tight or snug to the journals of the saw shaft N, Fig. 2, and let into those cradles to be allowed to slide easy, but not to play: those boxes to have a slot or oblong hole in each side for the reception of bolts which are let through the cradles and permanent in them, so that when it is desired, the saw shaft can be moved across the timbers carrying the boxes with it either way, to suit any thickness of stuff to be worked. Then screw the nuts in said bolts and the boxes are fast. When it is desired slack, the nuts, and the boxes, and shaft, and saw, will all move at once without disturbing the journals, they keeping their proper place and tightness. Then set up the set screw at the end until it touches the outer end of the shaft, and the saw will run steady. The outer end of the saw shaft should be turned to a point, or nearly so, and flat on the end, running against a flat center of the set screw,

which is kept steady by a jam nut: the shaft to be about two and a half inches diameter, the journals one and three fourths of an inch diameter, and six inches long in their bearings; the saw to be from three to four feet diameter. This saw is for the purpose of slabbing off the uneven and extra thickness of the boards and plank, or other material, thus saving the veneer that comes off for some useful purpose, and preparing the material to be tongued and grooved, and faced to a smooth surface by a facing wheel. Immediately after the board passes this set of rollers it approaches another bed plate L, Fig. 1, of cast iron. This is about four feet long, with three half circles cut out of the top, and one out of the bottom, to accommodate the cutter wheels I I, Fig. 1, for tonguing, and the grooving and edging tools. The bottom circle is a recess for one of the tonguing wheels I, Fig. 1, the lower edge of the plank being the tonguing edge. These wheels are two in number, they are made conical on their edges, and the tools *c c* are the same shape, and slipped in through a mortise made in the casting to suit the tools, which must be fastened in their places by set screws set in from the face of the cutter head; the cutter heads to be nine or ten inches diameter, having a sleeve or long fillet on them; this sleeve being bored out to sufficient depth to receive the end of the spindle—say four inches—leaving the top about a half an inch solid, and a small hole in it to receive a set screw for raising and lowering the cutter heads to any suitable distance required. The spindles of these cutter heads must stand at forty five degree angles from the floor or top of the machine, and crossing each other; bringing the cutter head on the outside spindle to operate on the inside rabbet of the tongue, and the head of the inside spindle to operate on the outside rabbet. Thus the plank moving between these wheels will receive its tongue.

The advantage of thus making the tongue will be this, that these wheels do not cut on a parallel line with the board, nor at right angles with it, as do the old plan of cutters, but cutting in an oblique direction, making as it were a drawing knife cut. Another advantage is that the edge of the plank that forms the rabbet, is planed and made smooth and at the same time the tongue itself is planed smooth. This cannot be done in the old way with two cutters projecting from a spindle setting at right angles from the board, and cutting in a sufficient distance to make a tongue, as they only operate on the edge of the plank or board, the tongue being naturally left but not made smooth, and is subject to become larger as the cutters wear by friction, caused by running over the sides of the tongue to cut away the wood each side of it to form the tongue. This is prevented in my cutters they operating on both sides of the rabbet at the same time. Another advantage is, that the tongue can be made to go in tight or easy at pleasure by bringing the wheels closer together, which is done by the sliding boxes which the spindles are mounted in. Immediately over these two wheels is another conical cutter R, Fig. 1, about the same diameter, which is about ten inches or a foot; each of said cutter heads to be capable of receiving six steel cutters *d*, *d*. This is for the purpose of dressing the groove edge. Its angle is about twenty-two degrees, and the cutters straight on their edges, but the same angle of the cone let through a mortise and fastened with set screws. This is to true the groove edge with the tongue edge, and give it a clean and perfect angle.

The advantage of this cutter over the ones now in use, is that it prevents the mismatching of the plank or boards, as is frequently the case in putting in three tools in one mortise, one cutting the groove, the others cutting the edges each side of the groove, and one of these projecting a little too far out, it must make a bad match, and perhaps make an open joint at the top, when laid on the floor. My broad cutters covering all the edge and leaving the groove to be cut by another tool or tools. Another advantage is, that it cuts obliquely, which prevents tearing the material if it should be knotty or shaky, inasmuch as it does not follow the line of the board or plank. The board in progress next approaches two scoring saws S, S, Fig. 1, very thin, about eleven or twelve inches diameter. These saws are for making a score in the edge of the plank, preparatory to cutting the groove, cutting two lines in the edge just as wide as the groove is intended to be, but not so deep as the groove, say about one-eighth of an inch deep. This is to prevent tearing in bad stuff. To mount those saws, there must be a flange two or three inches smaller than the saws, with a sleeve U, Fig. 1, about three inches long each side of it. On one side of it—the outward from the frame—fit one saw, then next put on a collar as thick as the width of the groove—except the thickness of saws—next to the collar the second saw, next to this saw another flange, and then a screw and nut; the screw to be chased on the outer end of the sleeve to keep up the second flange to the saws; the sleeve being bored to suit the shaft and left solid at the end—except for the set screw—slip it on the shaft and fasten it with a set screw. The two saws can then be moved in or out on the shaft without disturbing them in the collars. Slack the set screw on the shaft, and turn the one in the end, and the saws are both moved to their

proper places. By this arrangement you can take off the outside saw and collar, and replace it without the sleeve or back saw from their places, and return them again in a minute and never alter the shaft if you please. Slack the set screw and the sleeve will slide off with all on it, which will be convenient in some cases, in particular where the groove is not needed, as in weather boards. The board then approaches the grooving wheel W, Fig. 1, which has six cutters or teeth in it just as thick as the groove is wide; this has its sleeve and set screw the same as the other wheels, with narrow mortises in it. This differs from those in common use inasmuch as the teeth are rounded at the ends or points so as to work out around at the bottom of the groove. This is done for the purpose of strengthening the board or plank, as the common way of making a groove weakens the boards in the angles. The consequence is it is very apt to split off, particularly in thin boards. I consider these rounded tools an improvement. Underneath this cutter wheel is placed another of the same dimensions (Y, Fig. 1) as the grooving wheel; this is for rounding the tongue to match the groove. This wheel has nothing to do with making the tongue, but merely to round it.

It will be seen where the improvement consists, as a common tongue put in a square groove with the corners off, will never fill it up but leave a space. Between these two wheels and the scoring saws, there should be a roller, *f*, Fig. 1, to keep the material true. This should have set screws or levers and movable boxes. After the piece passes those two wheels and the roller, it is held down by another roller *f*, Fig. 1, of the same kind and mounted in the same way, but shorter—fourteen inches more or less—the next previous, to be longer, to accommodate the saw and wheel next to it—say two feet six inches. The finishing conical cutter R, Fig. 1, saws S, S, Fig. 1, and groove tools W, X, Fig. 1, are to rise and fall to accommodate the different widths of stuff. This is done by mounting on the frame two cast iron gallows frames O, O, Fig. 1, about three feet wide and the same in height, projecting about two feet four inches above the frame, and secured to the front of the top timbers, and braced from one to the other by braces. These are so arranged with slides as to receive two movable yokes or frames *p*, *p*, Fig. 1, capable of raising and falling, being fitted to the first mentioned frames, both made with receptions for the boxes of the spindles. From the center of each of said yokes—which are also of cast iron—is a stirrup *q*, *q*, Fig. 1, projecting about two inches from the yoke toward the front of the frame, reaching from the top edge of the lower rail of the yoke to the top rail, which is rather circular. In the top of said stirrup is let in a nut for the reception of the regulating screws P P, Fig. 1, the upper end being attached to the gallows frame by means of boxes—the stirrups to be wide enough between the straps to admit the screws P, P, Fig. 1, one inch in diameter, and to travel as far as is desired for the accommodation of the different widths. Those yokes and the spindles mounted in them, are all to move at once by the regulating screws P, P, Fig. 1. For the purpose of turning said screws P, P, Fig. 1, mount a shaft *b*, *b*, one and one eighth of an inch diameter in boxes to reach from one gallows frame to the other, crosswise the frame; on this mount two miter or bevel wheels Q, Q, Fig. 1, about eight inches diameter; on the top of the regulating screws, P, P, Fig. 1, mount two more of the same dimensions Q, Q, Fig. 1. These being geared together turn the cross shaft by means of a crank, and the yokes, spindles and cutters will move to the material at once. The screws should be eight threads to the inch. The center or saw shaft boxes, must be allowed to fall as much lower than the other shafts as the saw will become reduced by wear and tear, so as to keep the edges on a line with the other cutters. This is done by set screws rather longer than those to the other boxes, which are placed underneath the box; said boxes are fastened by means of nuts and bolts to the lower rail of movable yokes, and a slot in them long enough for their movement to accommodate the regulating to a proper height. After the piece passes the tonguing and grooving operation and the small rollers, one of which is mounted on the last bed plate L, Fig. 1, of the same kind as the first one spoken of—only a little wider on the upper edge and higher, to accommodate the roll stand. After it passes the last bed plate L, Fig. 1, it approaches a face plate M, Fig. 2. The object of this plate is to keep the material hard up to the bed plate L Fig. 1, while the facing cutters are operating upon the board. This face plate I consider new and useful, as it will keep the material steady and prevent its springing into the cutters of the finishing wheel after it leaves the little roller *f*. It must be made circular to correspond with the circle of the finishing wheel *a*, Fig. 1, and of sufficient width to keep it steady in its place while the material is passing behind it, causing the plank as it were to impinge on the bed plate as it passes the facing wheel *a*, Fig. 1, acting upon it so that the plank or other material will be compelled to pass a perfect gage: this plate to have two bolt holes through the top flange of it, and one through the lower flange; the bolts should be let in to the frame permanently, and the plate to

move on and off the bolts with ease, and to have a nut each side of the flange of the plate. This is done to accommodate different thicknesses of stuff. Slack the outside nuts and turn up the inside ones, and the plate is to its place. Said bolts to be about one inch diameter.

The next improvement consists in the finishing wheel *a*, Fig. 1, which must be a solid recessed wheel about three or four feet diameter. The object of recessing this wheel is the accommodation of the permanent face plate as above. It is made in the following manner: Make in the first place a solid wheel of cast iron about six inches smaller than the cut is intended to be, then place on the periphery of the wheel, about sixteen projecting tool beds *c*, *c*, *c*, *c*, Fig. 1, about three inches wide and about one inch thick, and three inches long—more or less—according to the length of the irons intended for use. Over the top of this bed piece is a strap *h*, Fig. 1, for putting one or more set screws *e* to keep the irons down in its place while cutting. This will make a kind of mortise to recess the cutter or plane iron. Slack the set-screws and the tool will slip out. This is preferable to making a hole through the tool, as it weakens and takes more time to shift it in and out to grind. The tool bed piece *c*, *c*, *c*, *c*, Fig. 1, should be set on the wheel in such angles as not merely to give the proper rake to the tool, but so as to raise the sides of it next to the center to an angle of about twenty two degrees from a horizontal line across the center of the wheel. This will give the finishing tools a complete rabbet tool cut. The tools should be about two and a half inches wide, made the same as the common plane iron—without the slit in them. The tool beds should project from the face of the wheel about one inch, and the cutters about a half an inch beyond them. The rake of the tools should be at an angle of about forty five degrees, the cutting edge pointing toward the bed plate or frame. This forms the recess to the inside of the wheel, to receive the stationary face plate M, Fig. 2 the cutters running around the edge of it, while the material is passing between the bed plate and the face plate. It then passes the finishing wheel *a*, to the fourth and last pair of rollers, K K, Fig. 1, and out of the machine: the shaft and boxes of the finishing wheel to be the same as the veneer saw, and its motion the reverse of the saw; that being with the grain and feed of the machine. All the cutters will operate against the motion of the feed, except the said veneer saw. This I consider a newly arranged wheel.

There should be guards *d*, *d*, Fig. 1, running the hole length of the machine, for the lower edges of the plank to rest upon, with one end a little higher than the other—say one fourth of an inch more or less. This will keep the material close to it after the material passes the two tonguing wheels I I, Fig. 1. There should be a short iron guard *h*, Fig. 1, say about three feet long. This should set at right angles from the face of the machine, this to move by set bolts to and from the machine, and to be of sufficient size to fit the rabbet of the tongue, and to be pushed up against it by the hand, and screwed fast, the lower edge of the material resting on the long guard, the short one filling up one side of the tongue rabbet. This will prevent all trembling and springing. Whenever the machine is shifted for different thicknesses of stuff, shift this guard also, pushing it hard against the tongue, screwing at the same time, this will secure strength and true work. On the first end of the long guard place a stationary knife B, Fig. 1, to clear the lower edge of the stub shot off. By putting on a roughing wheel in the place of the veneer saw, the saw may be dispensed with. In this case the veneer is lost, but it will do its work well, but not so fast. There may be a stationary knife used to smooth, instead of the finishing wheel. There may be also a cylinder used as a finishing wheel, in combination with the veneer saw or rougher, or without either, in combination with the tonguing and grooving tools and other parts of the machine.

By dispensing with the rollers, and tonguing and grooving apparatus, and using a carriage, the veneer saw and finishing wheel will take off the veneer sawed and planed at one operation, after the saw takes off the first veneer. By putting a broad set of cutters in the inside tonguing wheel, and wider tools with square edges in the wheel that rounds the tongue, taking off the short guard, and putting on one about one foot longer, to keep the material steady against the bed plate, and removing the scoring saws and the grooving apparatus, the machine will face edge and rabbet a board complete for weather boarding. This may be done by the machines now in general use, called Woodward's, Emmon's, and McGregor's machines, by putting on an extra spindle and cutter head running crosswise the machine, and underneath or behind the board; the cutter head to be put next to the guard side of the machine, with a movable bed plate or face plate on the face of the plank, to be kept hard against the face of the plank by screws, or a lever or springs. This must be put to the machine in between the rolls next to the third pair of rolls. By using the veneer saw and finishing wheel in combination with the feeding rollers and gearing only, this machine will be useful for ripping boards and plank edgewise, so as to make two pieces out of one; which is com-

monly done by the up and down saw. If done in this way, one piece will be planed as well as sawed at one operation, and with great speed.

I do not confine myself to a rotary saw, but may sometimes use an up and down saw as a veneer saw or for ripping. The dubbing—that is to say the stub shot—may instead of using stationary knives, be taken off by saws; cutter wheels like the one for facing with the tools set to suit it, or cylindrical cutters, or a backward and forward cutter, or up and down cutter, but I consider the stationary knives the best, and my own invention applied in this way.

The material may be cut to an equal width with a saw, or the old straight wheels, instead of the conical cutters, but I prefer the conical cutters. I consider them new, applied to this purpose.

This machine may be fed with an endless chain instead of rollers and cog wheels. Even the rollers may be geared with the straight toother cog wheels, but will not be so good and convenient as the bevel cog wheels and pinions, on account of the backing motion, &c. The yokes in the gallows frame may be moved up and down by means of racks and pinions, instead of the screws and bevel wheels, but the screws and bevel wheels are the best and safest, as the racks and pinions might fall while running, and do damage; the screw cannot. There may be a roller put between the finishing wheel and the last bed plate, instead of the face plate by making the wheel with a recess to receive it, and capable of running around it; but this would not be so good. The material being of different widths, the narrow stuff would be too far from the cut; it therefore would not be worked so true nor so smooth. The tonguing may be done by two vertical cutter wheels, one upon each side of the tongue, or by circular saws, or those now in common use, but they will not be so good, as they all run in a parallel line with the material, and the tongue is not planed but left rough on its sides. The scoring saws may be taken off and not used if the work is not required to be done very particular, and the groove cut with the groove tools alone; but not so safe and good; or thin cutters introduced in their place, which may be taken out and be ground as the rest of the cutters. By attaching to the frame opposite the tongue edge of the board a small extra vertical spindle A′ and cutter wheel with cutters suited to it, as shown in Fig. 3 a bead may be struck in the board, as is required in ceiling boards. This I believe has not been done in any machine; when this wheel is not wanted, slip it off, and leave the spindle standing in its proper place.

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

1. The combination of the veneer saw with the planing wheel, for the purpose of reducing the plank or board to a uniform thickness; and

2. I also claim the combination of the veneer saw, for reducing the plank or board to a uniform thickness with the tonguing and grooving wheels as herein described.

3. I also claim the manner of forming the tongue by the two tonguing wheels—I I—having pointed cutter irons with two cutting edges, the one cutting the side of the tongue and the other the shoulder of the same, the shafts of the said wheels standing at an angle of forty five degrees, more or less, and crossing each other at or about a right angle.

4. I also claim in combination with the tonguing wheels, the separate wheel for rounding the tongue.

5. I also claim the use of one of the tonguing wheels (the other being removed) for cutting a rebate upon the edge of the plank, where they are intended for overlapping each other, as in weather boarding.

6. I also claim in combination with the planing tonguing and grooving wheels, the wheel for forming a bead upon the edge of the board.

7. I also claim the stationary knives for cutting off the stub shot from the end of the plank in combination with the feed rollers.

REID R. THROCKMORTON.

Witnesses:
Z. C. Robbins,
Wm. Cooper.