

June 1, 1915.

DRAWING

419

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Finis D. Morris,  
Chief of Division E.

AWK.

# UNITED STATES PATENT OFFICE.

JAMES TOMPKINS, OF CONESVILLE, NEW YORK.

MACHINE FOR BORING AND MORTISING WHEEL-HUBS AND OTHER ARTICLES.

Specification of Letters Patent No. 419, dated October 6, 1837.

*To all whom it may concern:*

Be it known that I, JAMES TOMPKINS, of Conesville, in the county of Schoharie and State of New York, have invented a new and useful Machine for Boring and Mortising Timber, which is described as follows; reference being had to the annexed drawings of the same, making part of this specification.

1. The main frame to contain and support the several parts of the machine consists of four posts A A A A, (Figure 1) two bottom side rails B B, and two top side rails C C, two end girts D D, two end caps E E, two intermediate cross girts F F at bottom, and a longitudinal piece G under them, and an intermediate cross girt H at top—all framed together.

2. Two parallel ways I I (Fig. 2) fastened on the top of the main frame, grooved on the inside to admit the tongues of a sliding carriage.

3. A sliding carriage J for carrying the hub to be mortised, having tongues on its sides which slide in the grooves of the ways I I, and two screw-bolts K K—one serving as a pivot—the other as a clamp—for regulating and securing the vibrating part of the carriage.

4. The vibrating part of the carriage L (Figs. 1 and 3) for setting the timber to be mortised at any required angle according to the desired angle of the mortise to be cut, is composed of two parallel pieces of timber L L connected together by cross pieces framed into them, having at its front part a curved piece of iron M, with a slot in the center through which the clamp bolt K (Figs. 1 and 2) passes—the other screw bolt or pivot K' passing through the cross piece at the hind part, secured by a thumb screw, on which bolt the vibrating part of the carriage moves as on a pivot; the other thumb screw serving as a clamp to hold it fast at the angle required. In each side piece of this vibrating part of the carriage are two vertical apertures to admit the legs of the upper part of the carriage for holding the timber to be mortised, and two horizontal apertures intersecting the vertical ones and into which are driven wedges for securing the legs.

5. Upper part of the carriage for holding hubs, or cylindrical or other shaped pieces of timber to be mortised. N (Figs. 1 and 3, and 4) side pieces. O (Fig. 4) the legs. P (Figs. 1, 3, 4) shaft on which the gage and hub are fastened. Q gage or circular piece

of timber having its circumference divided into as many equal parts and notched as there are to be spokes in the wheels, or mortises cut in the hub; into which notches a straight bar or lever R moving or vibrating on a pin is inserted for holding the hub in a proper position to be mortised.

6. A bench upon which rectangular pieces of timber to be mortised are secured is made similar to that represented at S, (Fig. 5) and which is substituted for the one just described when required.

7. Frame for supporting the axle of the driving pulleys and for sustaining the cutters. This is made of iron in the manner represented at T (Figs. 1 and 2) and is supported on the top of the main frame at the opposite end from that at which the carriage is placed. U axles. V V V pulleys. W a loose pulley. X a four sided rectangular hollow chisel or cutter for cutting the mortise having a thread or screw on one end which screws into a female screw in a plate Y secured to the face of the frame T. Z (Fig. 2) a common screw auger attached to the end of this axle U by a hook and eye *a a'* and passing through a bar *b*—plate *y* and through the four sided hollow chisel X, having a collar *c* around it placed between the bar and plate, and turning with the axle U.

8. A screw shaft for bringing up the carriage with the hub to the cutters and for receding the same. This is marked *d*, Figs. 6 and 7, in the drawing and is placed in the lower part of the main frame—one end turning in a head block on one of the cross girts F—the other end turning in a head-block on one of the girts D,—having on it near this end two pulleys, *e f*, placed loosely, but made to turn this shaft first to the right and then to the left by gearing alternately with it by means of iron pins *g h* inserted into the shaft and two similar pins *i k* inserted into the face of the pulleys—the pulleys being moved on the shaft first one way and then the other in throwing them in and out of gear, by a sliding frame hereafter described. On the other end of this shaft is an endless screw *l* working into a rack on the side of a sliding bar moving the sliding frame first mentioned, and into a horizontal cog wheel *m*, through which passes a vertical shaft *n* turning in a step on one of the intermediate cross girts F', having on its upper end a pinion *o* (Fig. 2) which works

into a rack *p* fastened on the under side of the carriage for advancing and receding the same—the upper end of said shaft being kept in perpendicular position by a collar passing around it and fastened to the upper cross girt *H*.

9. The sliding frame for throwing the pulley in and out of gear with the screw shaft. This is marked *q* and consists of four pieces of timber, framed together, forming a rectangular frame,—the screw shaft passing loosely through the same—the sides of said frame being shaped into cams or projections so as to come in contact with the sides of the pulleys when moved forward by the sliding-bar.

10. The sliding-bar for moving the sliding frames marked *r*. The rack *s* before mentioned in which the endless screw works is fastened to this bar. The sliding bar moves in grooves in the cross girts;—it has two spring stops *t u*, which, alternately, come in contact first with one side of the sliding frame and then with the other in moving it with the pulleys on the screw shaft, in throwing them in and out of gear with the same. These stops may be regulated at pleasure by set screws.

11. *The bands*.—The upper and lower pulley next the cutters are straight banded as at *v*, which causes the screw-shaft to turn to the right and advances the carriage. The two pulleys next to these are cross banded as at *w* which reverses the motion. The third pulley *v'''* on the upper axle is for the band leading to the driving power. The fourth pulley *w* on the same shaft is loose and is for stopping the operation of the machine by shifting the driving band on to it when required.

*Operation of the machine*.—Having determined on the number of spokes to be inserted in the hub a corresponding guide or gage is fastened on the shaft at the upper part of the carriage, the hub to be mortised is then fastened on this shaft, the lever or stopping bar is inserted into one of the notches of the circular gage which holds it fast, the vibrating part of the carriage is then set so as to bring the hub to the cutters at the angle it is required to cut the mortise and made fast by the clamp screw, the machine is then put in motion by changing the band (leading from the driving power) from the loose pulley to the fast pulley on the cutter axle which turns the auger in the center of the four sided chisel, the latter remaining stationary; it also turns the pulleys. The straight banded pulleys are turned to the right the lower one being geared with the screw shaft by one of the iron pins in it coming in contact with the pin in the side of this pulley caused the

screw shaft to turn to the right which also turns the cog wheel in the same direction and also the pinion on the upper end of it; and the pinion working into the rack on the under side of the carriage causes the carriage with the hub to advance toward the cutters, and when they come in contact, the auger begins to bore by its rotary movement and as the hub advances the sharp sides of the stationary four sided chisel cut away the sides of the bored aperture, thus making a rectangular hole. The carriage continues to advance until the hole is mortised to the required depth. While the above operation of advancing the carriage and boring the spoke-hole has been going on the endless screw working in the rack has advanced the sliding bar. The spring stop in this sliding bar comes in contact with the sliding frame and pushes it over the screw-shaft toward the end of the frame carrying with it the two pulleys, disengaging the straight banded one from the shaft and engaging the cross banded one with it by means of the two studs or pins. This operation reverses the motion of the screw shaft and carries back the carriage and slide until the other spring stop at the end of the sliding bar comes in contact with the other side of the sliding frame carrying the pulleys back to their former position, disengaging the cross banded pulley and engaging the straight banded one. With the screw shaft which again reverses the motion of the screw shaft turning it to the right as before mentioned and advancing the carriage with the hub to be mortised, which, during this operation has had its position changed so as to receive a mortise in a fresh place, by turning the circular gage by hand and placing the stop bar in the next notch of the same and so on till all the mortises are cut.

The invention claimed by the subscriber as new and desired to be secured by Letters Patent consists in—

The combination, arrangement, and adaptation of the several parts of the before described machine for boring and mortising wheel hubs and other articles, whether constructed in the precise manner above described or in any other producing a machine substantially the same in construction and operation.

The construction of the four sided chisel and auger is not claimed except the manner in which it is fastened in the plate by a male and female screw. And the collar on the shank of the auger as before described. Also the swing carriage is not claimed.

JAMES TOMPKINS.

Witnesses:

NELSON FANNING,  
BARRET JONES.