C. E. Norris,

Boring Wood.

No. 6,374. Patented Apr. 24, 1849.

Fig: 3

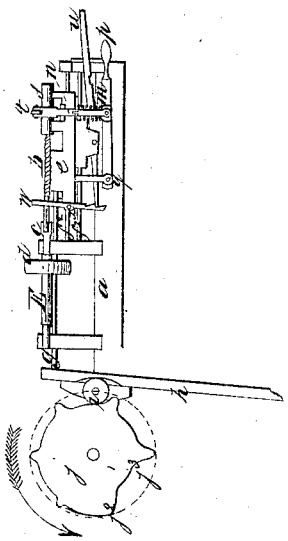


Fig: 2.

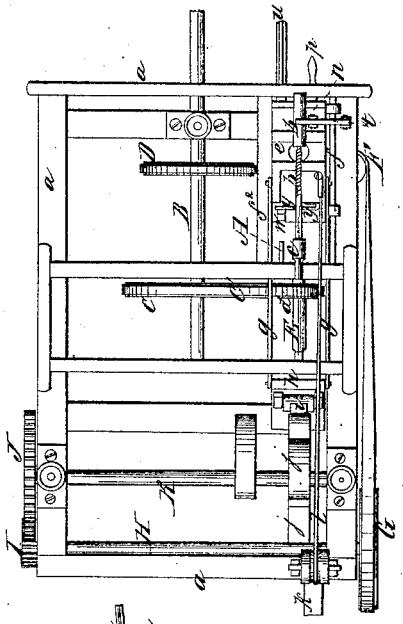


Fig: 4

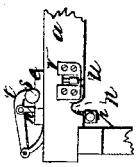
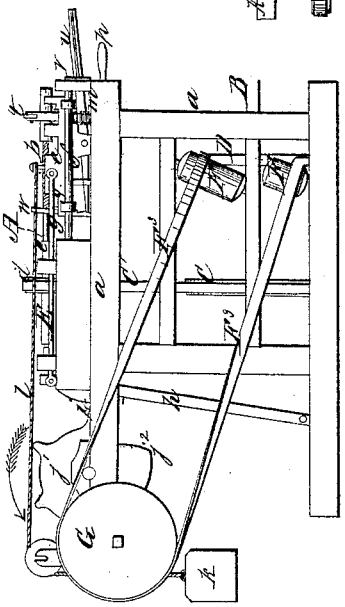


Fig: 1



UNITED STATES PATENT OFFICE.

CURTIS E. NORRIS, OF PEACHAM, VERMONT.

IMPROVEMENT IN MACHINERY FOR BORING BOBBINS.

Specification forming part of Letters Patent No. **6,374**, dated April 24, 1849.

To all whom it may concern:

Be it known that I, CURTIS E. NORRIS, of Peacham, in the county of Caledonia and State of Vermont, have invented a new and useful Machine for Boring Bobbins, Spools, &c., which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a side elevation of the machine. Fig. 2 is a bird's-eye view of the machine. Fig. 3 is a vertical longitudinal section through the center of the carriage, mandrel, cam-wheel, &c. Fig. 4 is a vertical section showing the apparatus for holding the spool or bobbin.

Similar letters in the several figures refer to corresponding parts.

a is the frame.

b is the boring-tool.

c is the socket into which the boring-tool is inserted.

d is the pulley for turning the boring-tool.

e is a carriage for carrying the spool to be bored.

f f' f² are slides or ways by which the carriage is guided and supported. One of said ways *f* is a round rod passed through eyes fixed to the side of the carriage. The other way is formed by two horizontal flat parallel plates *f' f²*, between which tenons on the side of the carriage slide back and forth.

g g are two stirrups that connect the carriage to the upper end of a vibrating board *h*, jointed by its lower end to a sill of the frame, its upper end moving to and fro in the arc of a circle by the action of the cam-wheel *j* for moving the carriage to and fro.

i is an anti-friction roller attached to the vibrating board *h*, against which the cam-wheel acts during its revolving motion.

s is the spool to be bored. *t* is a dog for holding it firmly to the carriage.

The cam-wheel *j* is so formed that the carriage shall recede a uniform distance from the boring-tool and advance toward it at unequal distances gradually increasing as the wheel revolves, the carriage gradually advancing toward and receding from the boring-tool at each successive movement of the wheel a segment of a circle, said unequal movement or advance of the carriage being effected by making the depressions between the protuberances which are equidistant on the periphery of the wheel of unequal depths and of a curvature gradually blending with the reverse curvatures of the protuberances, so that the transition of the roller *i* from a projection to a depression may be gradual and easy. The cam-wheel *j*, if made without the protuberances, would be like the common eccentric cam-wheel, and if when the machine is started the point j^2 were in contact with the anti-friction roller *i* and turned in the direction of the arrow the advance of the carriage with the spool to the boring-tool would be gradual and without any retrograde movement to clear the tool of chips; but by making the wheel with protuberances over its surface of equal radii the spool is caused to recede from the boring-tool at every few revolutions of the tool, in order to clear itself of chips, while the boring increases in depth caused by the increase in depth of the depressions on the cam-wheel. The roller *i* is kept in contact with the surface of the cam-wheel by the gravity of a weight *k*, attached to a cord *l*, fastened to the carriage. The dog *t* is held down upon the bobbin or spool by a helical spring *m*, through which is passed a connecting-rod *n*, that connects the dog *t* to a lever *p*, whose fulcrum is seen at *q*. The spring *m* rests against the top of the lever and the bottom of the carriage, exerting an influence against the lever *p* and causing the dog *t*, attached to the lever *p*, to press upon the spool. To disengage the dog *t* from the spool *s*, the end of the lever *p* must be raised, which contracts the spring *m* and lifts the dog *t*. When the spool is bored and is required to be moved and replaced by another spool not bored, the carriage will be held in a fixed position by a notched bar *u*, turning on a pin and made to drop and hook over a plate *v*, fastened to the end of the frame. During the operation of boring this bar is held clear of the plate *v* by a notched trigger *w*, that turns on a pin *x*, said trigger being held in contact with the notched bar by a spring *y*.

A is a stop inserted horizontally into the frame, against which the trigger *w* strikes in order to drop the notched bar *u* over the plate *v* and hold the carriage from moving. When the cam-wheel *j* has performed a revolution and the roller *i* has entered the depression j^3, the spool will have advanced toward the boring-tool as far as it is intended

to go, and then the trigger *w* will strike the stop A, vibrate the trigger, contract the spring *y*, and disengage the trigger from the bar, whose longer arm, containing the notch being heaviest, drops and brings the notch over the plate *v* and stops the motion of the carriage. The lever *p* is then raised, which raises the dog *t* and contracts the spring *m*. The bored spool is then removed and an unbored spool put in its place and the dog let down upon it. The long arm of the bar *u* is then disengaged from the plate *v* and the end of the short arm brought under a tooth of the trigger *w*, which holds the bar *u* disengaged from the plate *v*, as represented in Figs. 1 and 3.

In Fig. 4 the bar is shown engaged with plate *v*. B is the main or driving shaft located in the lower part of the frame or in any convenient place, to which the power is applied for operating the several parts. C is a pulley on the shaft B, around which is passed a band C′, that leads around a pulley *d* on the shaft E of the boring-tool. D is another pulley on shaft B, around which is passed a band F^3, leading around guide-rollers F F to a pulley G on the end of a horizontal transverse shaft H, having on its opposite end a pinion I, that gears with a cog-wheel J on the cam-shaft K.

Operation: By giving motion to the main shaft B by any convenient power the operative parts of the machine will be put in motion, causing the boring-tool to revolve in its stationary bearings, while the spool is caused to move to and from the boring-tool reciprocally for freeing the tool of chips, &c., as before described.

I do not claim any of the parts of this machine except in their application to said machine; but

What I do claim as new and of my invention, and desire to secure by Letters Patent, is—

The combination and arrangement of the cam-wheel *j*, hinged vibratory-board *h*, connecting-arms *g g*, carriage *e*, and cord *l*, weight *k*, notched bar *u*, trigger *w*, and stop A for imparting to the spool to be bored a horizontal reciprocatory motion to and from the boring-instrument and for arresting the motion of the carriage at successive intervals, in the manner and for the purpose herein set forth.

In testimony whereof I have hereunto signed my name, before two subscribing witnesses, this 2d day of June, 1848.

CURTIS E. NORRIS.

Witnesses:

T. SANBORN,

WILLIAM MATLOCK.