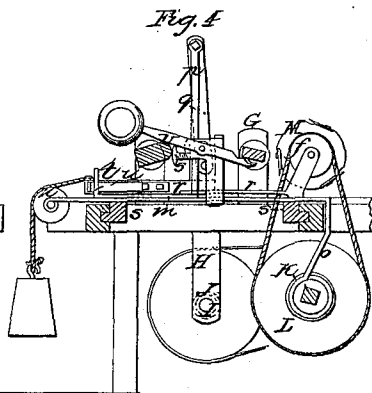
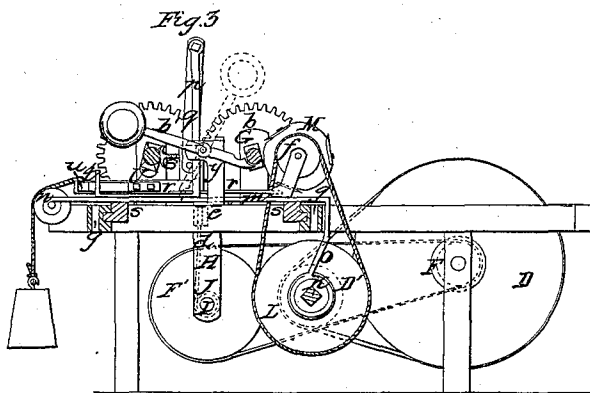
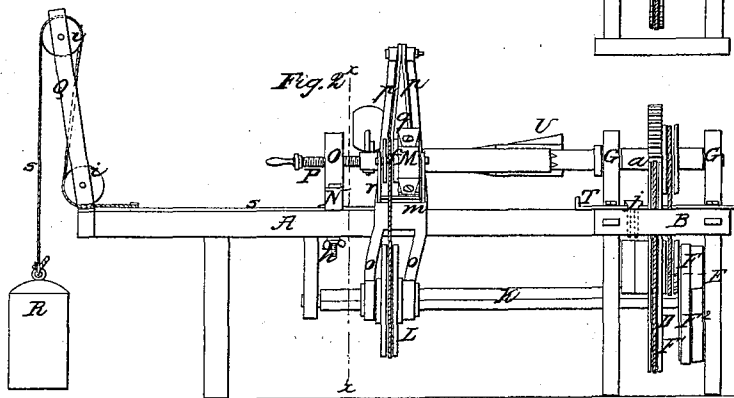
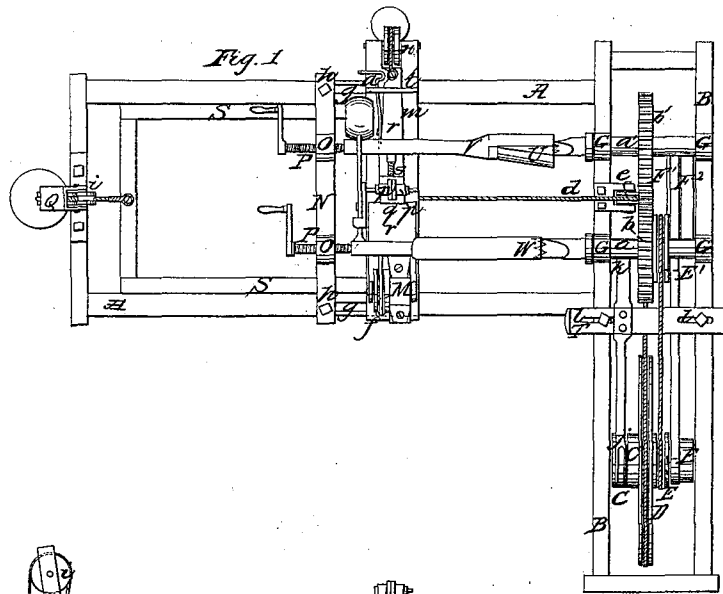


*T. R. Markillie,*

*Spoke Lathe.*

*N<sup>o</sup> 13,882.*

*Patented Dec. 1, 1855.*



# UNITED STATES PATENT OFFICE.

THOS. R. MARKILLIE, OF WINCHESTER, ILLINOIS.

## SPOKE-MACHINE.

Specification of Letters Patent No. 13,882, dated December 4, 1855.

*To all whom it may concern:*

Be it known that I, THOMAS R. MARKILLIE, of Winchester, in the county of Scott and State of Illinois, have invented a new and useful Improvement in Spoke-Machines, of which the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing of the same, in which—

Figure 1 represents a plan of a machine embracing my improvements, Fig. 2, a side elevation of the same; Fig. 3, a section taken through the line X X of Fig. 2, showing the cutter in position to cut or dress the spoke blank; and Fig. 4, a section taken through the same line in said figure showing the cutter withdrawn from the line of cutting on the completion of the spoke.

My invention and improvement consist in the arrangement of a cam on the pattern in such manner that on the completion of the spoke the cam will simultaneously cause the cutter to recede from the spoke, and leave a portion of the blank uncut of a size sufficient to form the tenon. This function is performed by the pattern acting in conjunction with the tracer and a spring catch which holds the cutter in its withdrawn position until the carriage has been drawn back to the place from whence it started.

My improvement further consists in the arrangement of the cutter and tracer upon a horizontal plate fitted in guides and suspended at a point between and above the pattern and blank, whereby the feed of the cutter follows the motion of the tracer instead of cutting counter or reverse as in other machines.

On a frame of suitable size, strength and construction are mounted the operative parts of the machinery; but of those parts which are more or less common to all machines of this class, I do not propose to enter into their detail further than is absolutely necessary for the illustration and description of my improvements.

At the end of a frame (A) of rectangular form, which supports a sliding carriage, and at right angles thereto, is firmly attached another frame (B) of similar form which supports the gearing of the machine. In the legs of the frame B a shaft is supported in suitable bearings. On this shaft are mounted a fast and loose pulley (C, C') around which a band passes from the engine or other prime motor. On the same shaft

are mounted three other pulleys (D, E, F) from which bands lead respectively to other three pulleys (D', E', F') communicating motion to the cutter, center mandrels, and drum which gives the requisite progressive motion to the cutter.

On the side rails of the frame B four standards (G) are erected which support the center mandrels (*a, a'*), on which are mounted two cog-wheels (*b, b'*) which mesh into each other. On the mandrel *a* is also fitted a pulley (E'), over which a belt passes from the pulley E, on the main driving shaft, thus communicating motion to the centers and through them to the pattern (V) and blank (W).

From the under side of the frame B two hangers (H) are suspended which support the shaft I. On this shaft are fitted a fast and loose pulley (F'), around which the belt from the pulley F on the driving shaft passes and from which it receives motion. On the same shaft is a drum (J), to which the end of a cord (*d*) is attached and wound. This cord passes over a sleeve (*e*) fitted in a bracket fastened to the frame immediately over the drum, and is made fast to the under side of the slide carriage.

The shaft K is supported by hangers on the under side of the frame. On this shaft is mounted the pulley D' which communicates motion to the shaft from a belt passing over it from the driving pulley D. This motion being imparted by the shaft K to the sliding pulley (L) is again transmitted to the rotary cutter (M) by means of a belt passing over the sliding pulley (L) and the pulley (*f*) on the cutter wheel.

About the middle of the side rails of the frame A, are two vertical slots (*g*) running longitudinally with the side rails for the reception of a screw bolt, which passes through them and the ends of a cross beam (N), which is firmly clamped to the rails by a clamp screw (*h*) on the under side. These slots are of a length equal to the extreme difference of the various lengths of spokes to be made, thus permitting the beam (N) to be adjusted to any required distance from the centers. On this beam two standards (O) are fitted which support the center screws (P), which in connection with the centers support the blank and pattern. At the end of the frame A and on the cross beam is erected a standard (Q) having a backward inclination sufficient to permit the weight

(R) to be raised or lowered without coming in contact with the frame. In this standard two sheaves (*z*) are fitted, over which the cord or chain (*s*) passes, to one end of which the weight (R) is fastened, the other end being made fast to the end of the sliding carriage (S) that carries the cutter and braces. This carriage travels in guides in the side of the frame, and is drawn forward so as to feed the cutter by the cord (*d*) attached to the drum (J), around which it is wound until the head of the bed plate on the carriage strikes a clutch (T), which by means of its two arms (*j* and *k*) simultaneously shifts the belt from the fast on to the loose pulleys (C' and F<sup>2</sup>), throwing the machine out of gear with the engine, and instantly stopping the further advance of the carriage (S). The drum (J) being thus thrown out of gear is free to be unwound to allow of the return of the sliding carriage, which is then drawn back by the action of the weight (R) attached to its rear end. The clutch is held in position by means of two bolts passing through slots (*l*) into the frame (B).

On the end of the rails of the carriage (S) a bed plate (*m*) is firmly bolted, having one of its ends projecting over the side of the frame and terminating in a bracket to support a sheave (*n*). The other end of the plate also passes over the frame and forms a bracket (*o*) which carries the sliding pulley (L) over the shaft (K). From about the center of this bed plate two standards (*p*) rise, at a point between the pattern and the blank and at a height sufficient to give free play to the cutter in dressing spokes of the largest diameter intended to be made by the machine. From these standards two arms (*q*) are suspended by a bolt passing through boxes in the top of the arms and standards. To the arms (*q*) is suspended a plate (*r*), which carries the block in which the adjustable tracer (*s*) is fastened. At one end of this plate are two standards which support the shaft that carries the cutter wheel (M), and the pulley (*f*), over which a belt passes from the sliding pulley (L) and gives motion to the cutter. At the other end of the plate (*r*), which slides in guides (*t*) is a spring (*u*) having its motion in the direction of the tracer. This spring when the cutters are thrown out of gear by the cam (U) on the end of the pattern (V) acting on the tracer (*s*) holds them in that position until the carriage has been again drawn back, when the spring is freed from its catch (*t*) by its curved point, which projects over the plate (*m*) striking against the beam (N), when the plate carrying the cutter is drawn forward toward the blank until the tracer comes in contact with the pattern, and held in that position by a weight attached to a cord passing over the sheave (*n*)

and having its other end made fast to the plate (*r*). By this arrangement of the cutter and tracer on the same bed plate having a reciprocating motion, a duplicate spoke is cut instead of a reverse one as in other machines.

In my machine a spoke itself may be used as a pattern, the only difference being the addition of a cam (U) on its end for the purpose of throwing the cutters out of gear when the spoke has been completed. The tracer (*s*) is made adjustable by having a screw cut on its shank, by the lengthening or shortening of which the cutter is caused to cut a spoke of greater or less diameter from the same pattern.

On the side of the bed plate (*m*) a standard (*y*) is raised, to which a loaded lever (*w*) is pivoted. The one end has a weight attached to it for the purpose of pressing the other end firmly against the blank to support and prevent it from vibrating while under the action of the cutters. When the spoke is finished the weighted end is raised and allowed to rest in a support formed on the standard (*y*) as shown in red line in Fig. 3.

The operation of my machine is very simple. The pattern which carries the cam (U) having been secured between the centers (*a* and P'), and the blank (*w*) adjusted in its proper relative position to the pattern between the centers (*a* and P), the cutters are thrown in gear, and motion communicated to the machine. The carriage which carries the cutters immediately commences to traverse along the blank to form or dress the spoke by the winding up of the cord *d* on the drum (J), meanwhile the loaded lever is put in position to steady the blank. This operation continues until the spoke has been completed, when the cam (U) on the end of the pattern by pressing against the tracer (*s*) throws the cutter out of the line of cutting, in which position it is held by the spring (*u*), leaving a sufficient portion of the blank undressed to form the tenon; the carriage (*s*) still progresses until it strikes against the end of the clutch (T), pushing it forward to the end of the range of its slots (*l*), when its arms (*j* and *k*) through slots in which belts pass from the driving pulleys will have shifted the belts from the fast to the loose pulley on the main driving shaft, and from the fast to the loose pulley on the shaft on which the drum is mounted, which by the cord *d* draws the cutter carriage forward, thus stopping the machine, and throwing the drum out of gear, so that the cord may be unwound and the carriage drawn back by the weight R attached to its rear end, simultaneously. The finished spoke having been removed and a new blank inserted, and the cutters again thrown in gear by the pressure of the spring

on the beam (N) on the return of the carriage, the machine is again ready to dress a new spoke on the application of the power to the machine, which is accomplished by  
5 pressing or forcing back the clutch (T) to its original position, the arms of the clutch again throwing the belts from the loose to the fast pulleys.

What I claim as new and desire to secure  
10 by Letters Patent is—

1. The arrangement of the cam (U) on the pattern (V) in combination with the

tracer (s) and spring (u) in the manner and for the purposes herein described.

2. I also claim the particular arrangement  
15 of the rotary cutter and tracer in combination with the plate that supports them suspended in the manner and for the purposes described.

THOS. R. MARKILLIE.

Witnesses:

T. HANNAY,  
BENJA. Z. F. LLOYD.