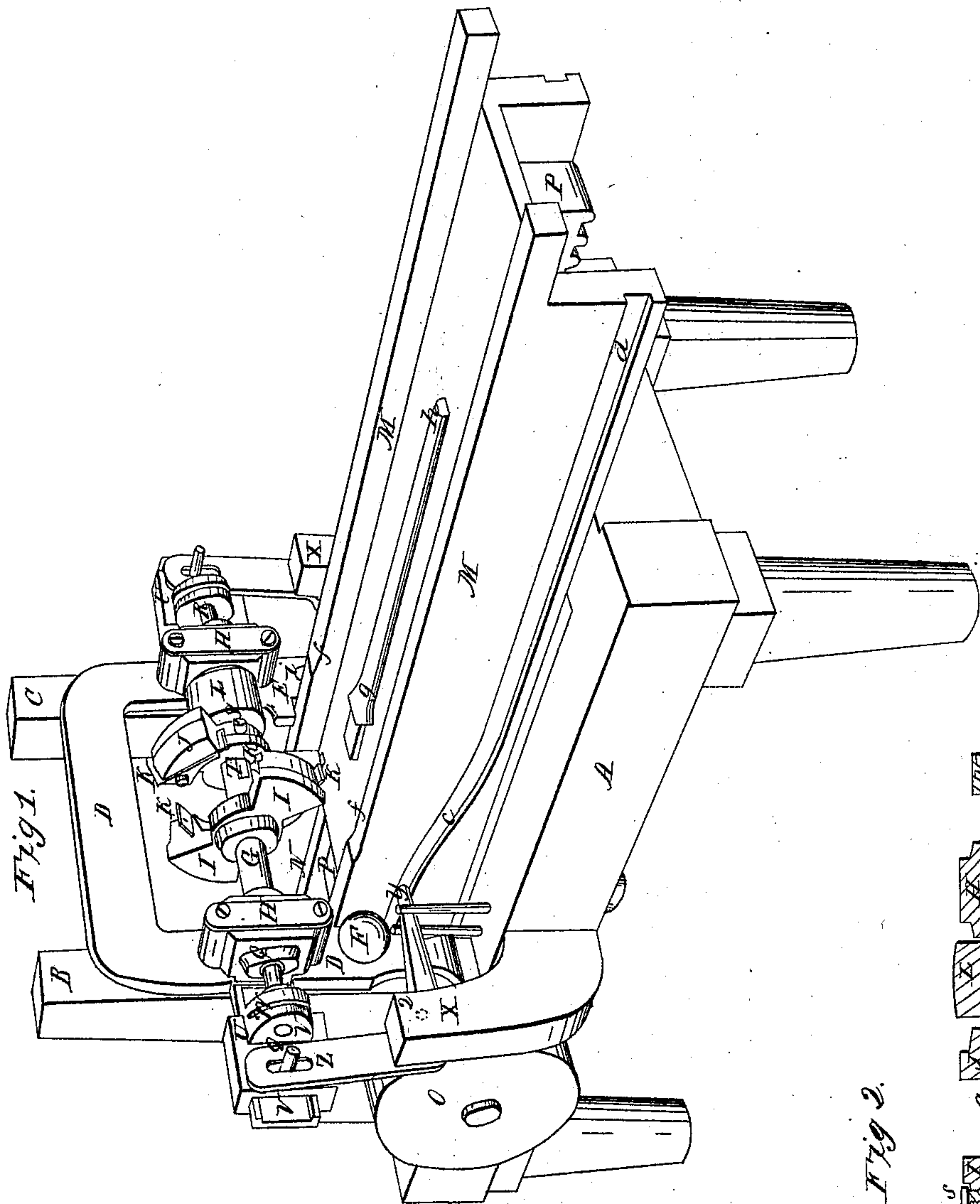


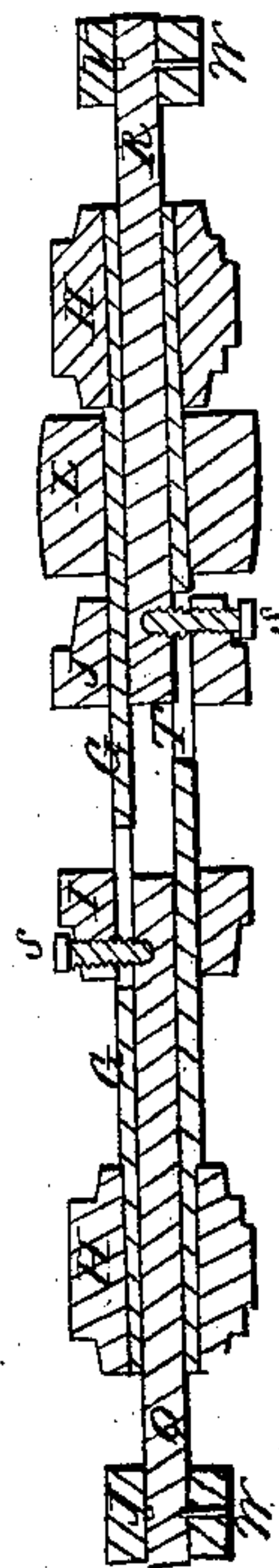
*R. P. Benton,  
Spoke Machine,*

*No. 10,662,*

*Patented Mar. 21, 1854.*



*Fig 2.*





# UNITED STATES PATENT OFFICE.

R. P. BENTON, OF ROCHESTER, NEW YORK.

## MACHINE FOR DRESSING SPOKES.

Specification of Letters Patent No. 10,662, dated March 21, 1854.

*To all whom it may concern:*

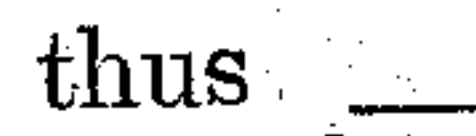
Be it known that I, R. P. BENTON, of Rochester, in the county of Monroe and State of New York, have invented a new and useful Improvement in Machines for Dressing and Forming Spokes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification.

I am aware that O. Mather constructed a machine for dressing spokes by rotating cutters, which apparently produced the desired result, but when subjected to a practical test has been found inoperative, arising I have no doubt from complexity of movement, number of cutters (there being not less than eight cutter heads required) and variety in the shape of the bits used in those cutter heads. I also may here advert to the fact existing in his machine that the spoke must be secured between chucks or mandrels applied to the ends thereof, and it has been found in practice as a consequence that even, in stout short spokes they are liable to spring, but much more so in long and slender ones, such as used in sulkeys or trotting wagons where the spokes are near three feet long and very slender.

In my first attempt in dressing spokes, I fell into the same error by essaying to dress both sides simultaneously, and was constrained to adopt the present method of dressing only one side at a time and by placing the timber on a firm unyielding bed or carriage passing under the rotating cutters. I now accomplish with a single pair of cutter heads and one form alone of bit, every variety of configuration exhibited in the cross section of a spoke cut at different lengths; and do more than Mather or any one else, viz, cutting the flat of the spoke next the tenon, as well as the perfect oval at the end entering the felly; also forming the wrist or small portion near the tenon end, and the feather edge on the front of the spokes at that place. In this I differ from Mather as his vertical cutters forming the upper and lower sides of his spoke are mere gouges and consequently cannot dress the flat thereof; his horizontal cutters of which there are four heads it is true have a side, or lateral adjustment, but the only effect thus produced is that of giving "the taper to the spoke" and rounding the

edge; as for forming the wrist I do not see how it can be effected in Mather's machine or the feather edge either by these cutters. I therefore think his a complicated inefficient machine; whereas mine is one of the greatest simplicity of construction (certainly not costing more than a tenth of the price) and easily of comprehension both as regards construction and mode of operation; small in the number of cutter heads, and only one pattern of bit, no matter what size of spoke is to be dressed as I can dress those varying an inch or more in the width of tenon and considerably varying in thickness with the same bit.

To enable others skilled in the art to make and use my improvement I will proceed to describe it.

In the drawing A Figure 1, is the frame; B and C, uprights firmly fastened to A; D, D', E a frame of metal (or cross head) secured only at one end at a time to one of the uprights, being represented as attached to B by a pivot bolt F, upon which it has a vertical play, the bolt F has a screw cut on its end for entering the upright and it is withdrawn after one side of the spoke is finished, and shifted to the opposite side pins or upright into I, when finishing the other side of the spoke; as it is by this oscillating play of the cross head D D that the feather edge of the spoke at the wrist is given; H, H are fixed boxes on the frame D D supporting the cylindrical shaft G; within this shaft slide two short shafts Q and R which rotate with the shaft, and have also a lateral movement by means of the stop T in which the screw S slides; this screw enters Q and P, passes through the hub or cutter heads, carrying the arms I, I and J, with bits K K K K, these bits are so formed that in one line of their rotation, a plane shall be formed, and the continuation of the bit exhibit a concave line thus , of course the judgment must be exercised in the joining these lines as they determine the general character or shape of the spoke.

In Fig. 2 a section of the shaft G', cutters &c. &c. is seen; L is the pulley for giving rotary motion to the shaft and cutters; the lateral movement is obtained by n n, slides working on projecting arms from D D and E; V is a box connected with the slide and through which the short shaft Q passes; W Fig. 2, is a steel feather enter-



ing a groove in Q for sliding it laterally; X X are arms projecting from the frame A and receive the pivot on which Y, an elbow lever is pivoted by a screw bolt 2 (see dotted line) at its angle, so as to allow of slight change of position. *a* is a pin in U and passes into the slot at the upper end, of *z*, the elbow lever communicating motion to the short shafts Q or R; the lower end Y of the elbow lever enters the irregular formed groove *c*, *d*, in the carriage M on which the spoke timber is secured, and the pin rising and falling in the groove actuates the elbow lever and with it the shaft &c. drawing laterally the cutter head E thereon. *b b* are upright pins in the frame A to steady the end of the elbow lever. Under the carriage M M is placed a rack the end shown at P, and it is moved by a pinion on the shaft of pulley O, said carriage slides on ways N, upon the edges of M will be noticed slight hollows or depressions at *f*, the object of which is to give the twist to the spoke by their permitting the free end of E of the frame D D to sink and with it the shaft, cutters &c.; when the spoke is turned over the pin or bolt F is changed to the opposite side into the hole *i*, and then the hollow *f* on the other side of the carriage comes in play.

The operation is as follows: A piece of suitable timber secured on the carriage M by small bench knives or other devices at their ends, is moved under the rotating cutters driven rapidly by pulley L: it will be noticed that the cutters are expanded to their utmost by the end Y of elbow lever being in the highest part of the groove *c d* and consequently no part of the bits, but the straight portion cuts the spoke, this forms the flat thereof at the tenon; now as the carriage moves along, the grooves sink and with them the ends of Y and necessarily contract the cutters toward each other, and thus form the first portions of the curved side, it is at this point that the free end E of the metal frame D D is permitted to sink

in the bottom *f*. As one side of said frame always rests on the edge of the carriage, this gives the wrist at *z* or diminish of the spoke near the tenon end; on further movement of carriage the bottom *f* is passed, and the grooves *c d*, still facing the cutters are drawn closer, and gradually changes the configuration of the edge until the cut approaches a semi circle; and thus one side or half the spoke is formed; the carriage is drawn back, the pivot bolt F, changed to the opposite hole *i* (seen in Fig. 1), the spoke turned over with the finished side down and again passes under the cutters, this shows the object of the groove *f* on both edges, as the feather edge at the wrist is now reversed. In this manner difficulty of spring of the spoke timber is avoided, and a beautiful and accurately dressed spoke produced, ready for cutting the tenon in another machine, and so smooth as not even to require the use of sand paper.

The above description applies to a single spoke but it will be understood in dressing a number, that the first side of all required will be dressed and then the bolt F changed, and the other side operated on.

Having thus obtained a mode of making a constantly varying cross section in the shape of the spoke, with a single pair of cutters in which is given a rotary, a lateral and an oscillating motion, and what I claim as my invention and desire to secure by Letters Patent is—

The arrangement producing these different movements as described and set forth in the foregoing specification, viz, the shafts G and Q, R, frame D, D, E carriage M with its grooves *c*, *d*, and *f* elbow lever Y, Z, slot F or their equivalents.

In testimony whereof I have hereunto signed my name before two subscribing witnesses.

R. P. BENTON.

Witnesses:

JOHN F. CLARKE,  
SAML. GRUBB.