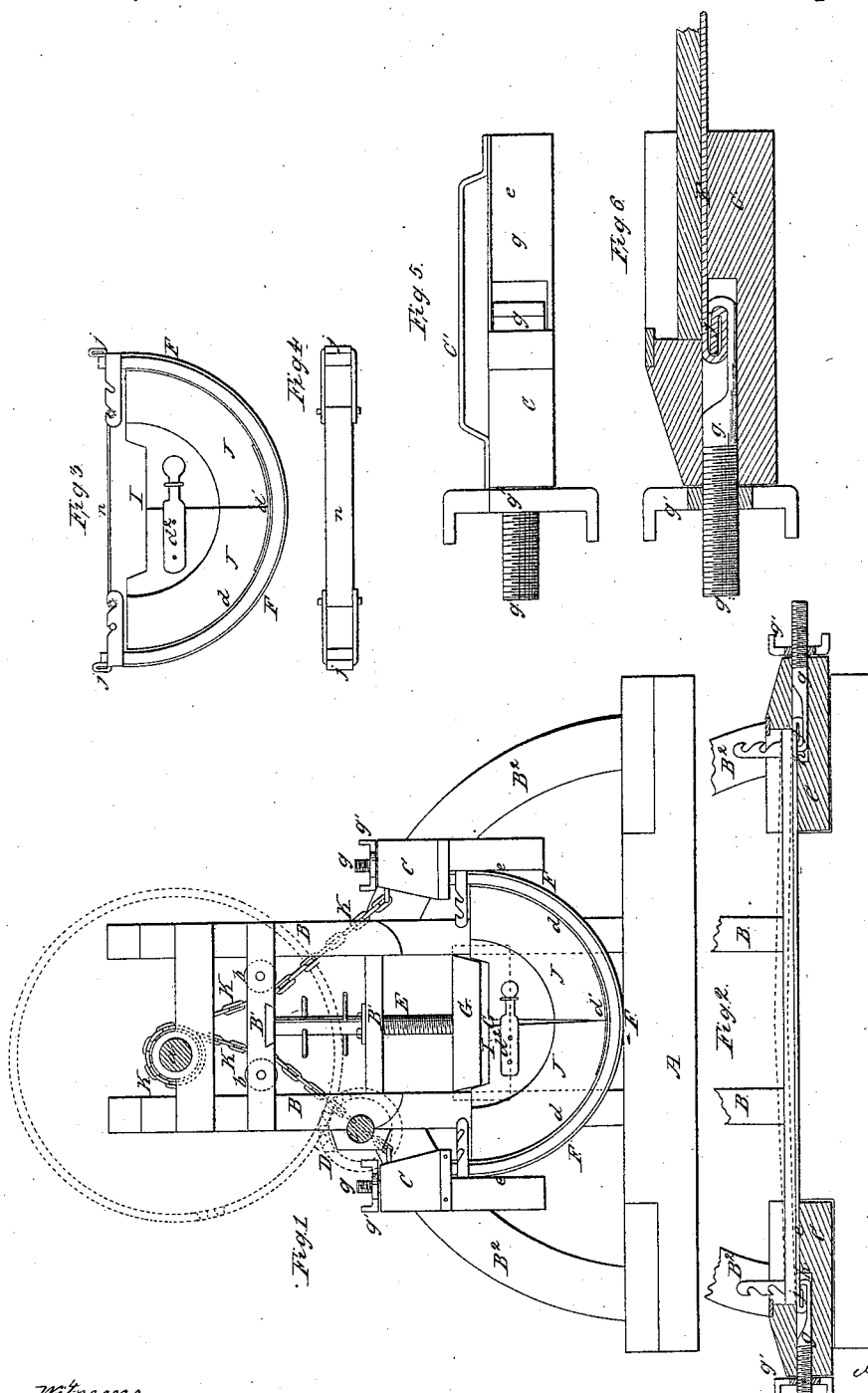


*J. Fishbaugh,  
Bending Wood.*

*Nº 54,316.*

*Patented May 1, 1866.*



*Witnesses  
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# UNITED STATES PATENT OFFICE.

JOHN FISHBAUGH, OF TIFFIN, OHIO.

## IMPROVEMENT IN WOOD-BENDING MACHINES.

Specification forming part of Letters Patent No. 54,316, dated May 1, 1866.

### *To all whom it may concern:*

Be it known that I, JOHN FISHBAUGH, of Tiffin, in the county of Seneca and State of Ohio, have invented a new and Improved Machine for Bending Wood; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a front elevation of my improved machine, showing the mode of bending a piece of wood. Fig. 2 is a view showing a piece of wood under compression previously to bending it on the pattern-block. Fig. 3 shows a piece of wood bent about the pattern and confined by a strap. Fig. 4 is a top view of Fig. 3. Figs. 5 and 6 show the construction of the clamping-blocks.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to an improvement in bending wood for various purposes, but more particularly for the felloes of wheels. It has been found that in bending wood, particularly thick pieces, by machinery hitherto constructed for this purpose the outside surface, or that which takes the greatest curve, will have its fibers very much distended, and in many instances even torn asunder, and if worm-holes, knots, or other imperfections occur in the piece which is being bent it is often so much injured as to be useless after the operation.

The main object of my invention is to remedy this evil by previously bending or springing the piece of wood in an opposite direction to that which it is required to finally bend it, at the same time compressing said piece, so that when it is bent about a pattern the distention of the fibers of its surface of greatest diameter will not impair or be sufficient to injure the strength or cause a separation thereof, as will be hereinafter described.

Another object of my invention is to construct the bending machinery and the pattern about which the wood is bent in such manner that the latter will be distended during the act of bending a piece of wood upon it and again contracted when the bending operation is complete, so that it can be quickly removed from the bent wood and used in a similar manner again, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A represents a strong piece of timber, which forms the sill of the machine, and B B are vertical standards, which are framed into the sill A, and which are strongly braced by means of horizontal cross-beams and two curved braces, B<sup>2</sup> B<sup>2</sup>, which latter serve as guides for the compressing-blocks C C, hereinafter to be described.

The upper part of the frame is made somewhat wider in one direction than the lower part, for the purpose of affording end bearings for a windlass, *a*, and two friction-rollers, *b b*. The windlass *a* carries on one end a large spur-wheel, D, which is indicated in red, and which engages with the teeth of a pinion, D', also indicated in red. A crank (not shown) is applied to the short shaft *c* of the pinion D', by means of which the windlass *a* can be rotated.

Other contrivances may be employed for rotating said windlass; but I prefer the two wheels and crank which I have just described.

E represents a vertical screw with radial arms projecting from its upper end. This screw, at an intermediate point between the upright posts B B, has its bearings in the cross-bars B' B' of these posts. Its lower end is tapped through a vertically-sliding follower, G, which is suitably guided by said posts, and which has a wedge, G', formed on or applied to its front surface, as shown in Fig. 1, the sides of which taper downward. By turning the screw E the follower may be raised or forcibly depressed.

The ends of the sill A have recesses formed in them for receiving the two compressing-blocks C C, so that when these blocks lie in their recesses their surfaces *e e* will be flush with the upper surfaces of the sill, as clearly shown in Fig. 2. These blocks are each provided with a hooked screw, *g*, the threaded end of which passes out through one end of its block and receives the nut *g'*, by turning which the screws can be moved outward. The hooked screw *g* of each block C moves in a recess, *h*, below the surface *e* of the block, and the hook thereof may be moved beneath the enlarged head of this block. These blocks, which are constructed alike, should be prop-

erly strapped and strengthened to resist the strain to which they are subjected, and they should be furnished with loops  $O'$  on their back surfaces for receiving the curved guides  $B^2 B^2$ . These blocks are also provided with staples on the upper sides of their enlarged ends, by means of which chains  $K K$  are connected to them, which chains are also connected to the windlass  $a$ , as shown in Fig. 1.

As my machine is intended more particularly for the bending of fellies for wheels, I will describe those parts which I employ for this purpose.

$J$  is a semicircular pattern-block, which is centrally divided and its two parts connected together by an outer strap,  $d$ , and a spring,  $d'$ , the action of which latter is to keep the two parts of the pattern closed, as shown in Fig. 3. The fastening at  $d'$  is intended merely to prevent the two parts of the pattern from being drawn too far apart. The upper edge of this pattern is cut out, as shown at  $I$ , to receive the lower end of the wedge  $G'$  on the follower  $G$ , and to allow this wedge to force the two parts of the pattern apart, as shown in Fig. 1, in the act of screwing down the follower  $G G'$ , for the purpose of forcing the pattern down upon the central portion of the bowed strip of wood until said central portion of the wood bears upon the central portion of the sill  $A$ .

$F$  represents a metal strap which is sufficiently thin to bend freely, and which has enlargements  $j j$  formed on its ends, as shown in Figs. 2 and 6. These enlargements  $j j$  are formed on the lower side of said strip, and are received by the hooks on the ends of the screws  $g g$ , so that when the strip lies upon the sill  $A$ , as shown in Fig. 2, and the screw-nuts  $g' g'$  are tightened, the strip  $F$  will be a means of connecting the blocks  $C C$  together and enable the attendant to move both blocks toward each other. The strip of wood to be bent is properly steamed and introduced between the blocks  $C C$ , its ends abutting against the vertical surfaces of the enlarged heads of these blocks, as shown in Fig. 2. Now, upon turning the screws  $g g$  so as to move the blocks toward each other, the strip of wood will spring up in the center, as indicated in red, Fig. 2, and be retained in this condition.

The pattern  $J$  is now adjusted upon the strip of wood and the follower  $G$  brought down forcibly upon it, the wedge  $G'$  spreading it apart, as shown in Fig. 1. At this stage of the operation the windlass  $a$  is rotated and the chains  $K K$  wound upon it, which draws up both blocks  $C C$  simultaneously, and with them the strip of wood and the strap  $F$ . When drawn up to the highest point the blocks assume a vertical position. (Shown in Fig. 1.) The two ends of the strip  $F$  are now connected together by means of a strap,  $n$ , (shown in Figs. 3 and 4,) and the follower  $G$  elevated so as to allow the pattern  $J$  to be removed from the machine as well as from the strip of bent wood and its strap  $F$ . The strip of metal  $F$  serves

a twofold purpose in my machine—viz., it supports the piece of wood while it is being bent and draws it up snugly against the pattern  $J$ , and it also serves as a means of connecting the two compressing-blocks  $C C$  together at the commencement of the operation of bending.

I am aware that attempts have been made to shorten bars or strips of wood previously to the operation of bending the bars by contrivances which were applied so as to exert a force directly in a line with the bars, which latter were clamped firmly upon a flat surface previously to applying such force, for the purpose of preventing these bars from springing or bowing.

I am also aware that the end blocks against which the ends of the strip of timber being bent abut have been made to oscillate, and also to follow up the strip of wood during the operation of bending the strip into a curved form, as shown in Adam Luckhaupt's patent of October 1, 1861.

I do not therefore claim shrinking or shortening the fibers of wood previously to bending it, nor do I claim oscillating and sliding end blocks which are acted upon by the devices which bend the strip of timber around its pattern, but desire to confine my invention to a method, substantially as described, of shortening or shrinking all the fibers of a bar of wood during the act of bending such bar about a pattern, thus enabling me to employ the same contrivances to shorten the bar that are employed for bending it and for clamping it and the pattern upon the sill  $A$ .

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. Shrinking or shortening all the fibers of a bar of wood by means of the devices which are used for clamping the pattern and wood upon the sill  $A$  and the devices used for bending such bar about its pattern, substantially such as described.

2. The method, substantially as described, of bending wood into curved forms, to wit, by first bowing or arching it and then bending it about the pattern in a converse direction to that in which it was first bent or bowed, substantially as set forth.

3. The construction and arrangement of the shouldered blocks  $C C$ , hooked screws  $g g$ , nuts  $g' g'$ , connecting-strip  $F$ , having enlargements formed on its ends, and the recessed sill  $A$ , all used together substantially as described.

4. So constructing the pattern and the follower and combining the same that the expansion of the pattern is effected by the descent of the follower  $G$  and its contraction insured by the ascent of the follower, substantially as described.

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Witnesses:

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