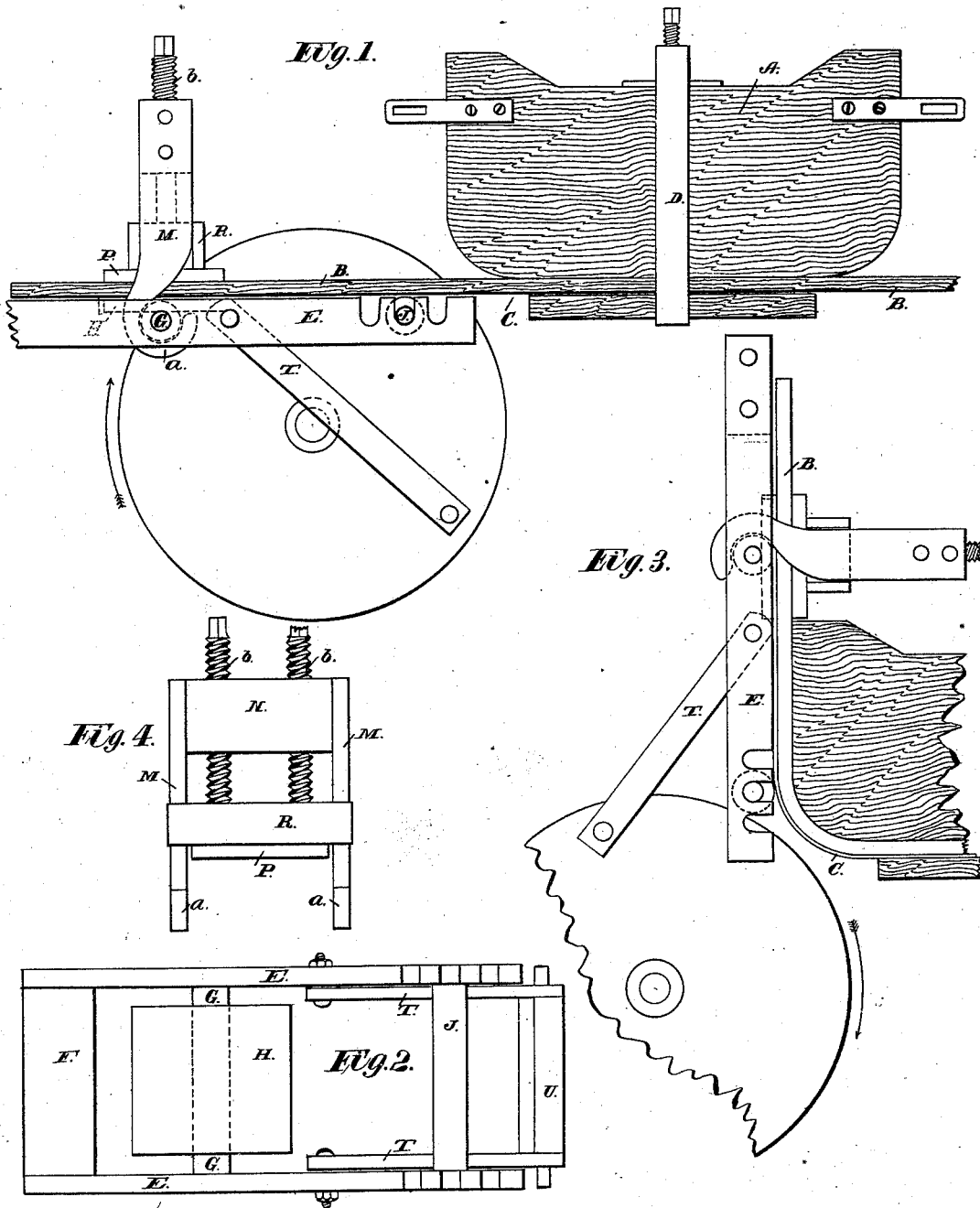


F. W. C. LANGE.
Wood-Bending Machine.

No. 216,522.

Patented June 17, 1879.



Witnesses:
Chas. M. Beck
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UNITED STATES PATENT OFFICE.

FRIEDRICH W. C. LANGE, OF DAYTON, OHIO.

IMPROVEMENT IN WOOD-BENDING MACHINES.

Specification forming part of Letters Patent No. **216,522**, dated June 17, 1879; application filed April 23, 1879.

To all whom it may concern:

Be it known that I, FRIEDRICH WILHELM CHRISTIAN LANGE, of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Wood-Bending Machines; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an improvement in machines for bending carriage-bows.

As the art is ordinarily practiced the strips to be formed into bows are steamed and clamped, together with an elastic metal plate, upon the under side of the former-block or frame having its lower corners rounded to correspond with the curves to be given to the bows. The outer ends of the strips and metal plate are then firmly clamped together, and by means of pressure-rollers the projecting ends of the strips and plate are brought upright against the ends of the former-block. Owing to the thickness of the strips, the length of the radii of the inner and outer surfaces of the strips and of the metal plate are different when bent around the corners of the former. Consequently, unless the wood is crowded or upset at the bend, the strips will be longer than the metal, and are apt to break or buckle out of shape, so as to either spoil the bows entirely or destroy their symmetry, for it must be remembered that they are rigidly clamped to the plate near their ends and cannot slip upon it.

The object of my invention is to remedy this difficulty and insure the proper upsetting or crowding of the fibers of the wood at the curves or bent portions, and thus prevent the bows from breaking or buckling out of shape.

By reference to the following description, the construction and mode of operation of my improvement will be clearly understood, and the novelty of the invention will be explicitly set forth in the claims.

In the drawings, Figure 1 is a side elevation of a former-block with the strips clamped on, and showing the application of my bending device. Fig. 2 is a plan view of my improved clamp and bender frame. Fig. 3 is a side elevation, showing the position of the parts after the strips have been bent up. Fig. 4 is a side elevation of the clamp-frame.

A represents any ordinary or suitable sta-

tionary former-block. B represents the wooden strips to be bent into bows, and C the elastic plate of sheet-steel. D is any suitable clamp by which the strips and plate C are firmly held upon the under side of the former-block.

My improved bending device consists of two stout parallel bars, E, preferably of metal set edgewise and bound together at one end by a cross-piece, F, as shown. The length of these bars is about that of the upright ends of the bows B, and their distance apart is a little greater than the width of the former-block A. Between the bars E, and about half-way from their ends, I pivot a stout metal roller-shaft, G, upon the upper side of which is fastened a platen or rectangular metal plate, H, whose upper flat surface is flush with the upper face of the cross-piece F. If desired, this plate and roller may be of one piece. In the upper edges of the bars E, near the ends opposite the piece F, are a series of grooves or notches in line with each other, to receive and journal the ends of a second stout roller-shaft, J, whose top surface is in the same plane, or nearly so, with the plate H and cross-piece F.

M M are two flat parallel metal bars, braced and held together at their upper ends by a cross-piece, N, and having their lower ends formed into hooks *a*. Between these bars M is fitted a metal plate, P, corresponding in size to the plate H. This plate P has formed or attached in any suitable way to its upper side a guide-piece, R, whose ends are recessed to allow the passage of the bars M, as shown. Passing vertically through the piece N are two or more set-screws, *b*, whose function will be explained farther on.

T T are two stout parallel bars of wood or iron, braced and held together at their lower ends by a cross-beam, U, and having their upper ends pivoted to the bars E at a point between the shaft G and roller J, and preferably nearer the former, as indicated.

The device is applied as follows, reference being had to Fig. 1, where the strips B and plate C are clamped to the former-block, ready to be bent up: The bars E, with their attachments, are placed in position under the plate and strips, with the bent end of the plate hooked over the rear edge of the platen H, as

seen by the dotted lines. The hooks upon the arms M are then made to grasp the shaft G just within the bars E, and, by means of the set-screws *b*, the plate P is forced down upon the strips B just over the plate H, thus forming a clamp, which holds the strips and plate C tightly together. As thus applied, the ends of the strips B rest upon the cross-piece F, and the roller J bears against the under side of the plate C at or near the bending-point. By this construction and arrangement the strips are securely held at the points where they are most likely to break or buckle. To effect the bending, power is suitably applied to the arms T in such a manner that the bars E are raised from the rear gradually and evenly until all the parts are brought up in the position shown in Fig. 3, when the bending is finished, and the bows may be held to the former-block by bars passing through the staples *c*.

By this bending device the bows are crowded or upset at the corners, and all liability of breaking or buckling is obviated.

By having several grooves in the bars E the fulcrum roller or bar J may be shifted, so as to bring in the proper position with reference to the curves to be made in the bows.

Instead of pivoting the roller G and plate H so as to be self-adjusting, they may be attached rigidly to the bars E, if desired, and instead of making the bar J a roller, it may be any shaped bar incapable of turning, but made adjustable in any suitable way, so as to set it nearer to or farther from the plate H.

Again, instead of the lifting-bars T, applied from below, chains may be attached to the bars E, between the fulcrum J and clamp, which, passing up, are connected to any power machinery which will bend up the bows in the before-described manner.

Having thus fully described my invention, I claim—

1. A rigid bending-frame for carriage-bows, having a clamp for holding together the bending-plate and bow-strips, and having a fulcrum bar or roller bearing against said plate, and strips at or near the bending part, and having any suitable lifting device applied to said frame between the fulcrum-bar and clamp, whereby the bows, in being bent, are thoroughly upset without breaking or buckling, as set forth.

2. In a bow-bending frame, the pivoted self-adjusting plate H, in combination with the hooked clamping-frame M, with its plate P, as and for the purpose specified.

3. The combination, with the rigid bars E and clamp H P, of the adjustable fulcrum roller or bar J, as and for the purpose specified.

Witness my hand this 25th day of March, A. D. 1879.

FRIEDRICH WILHELM CHRISTIAN LANGE.

Witnesses:

CHAS. M. PECK,
PATRICK H. GUNCKEL.