

(No Model.)

H. COBB.
SHAFT BENDING MACHINE.

No. 452,339.

Patented May 12, 1891.

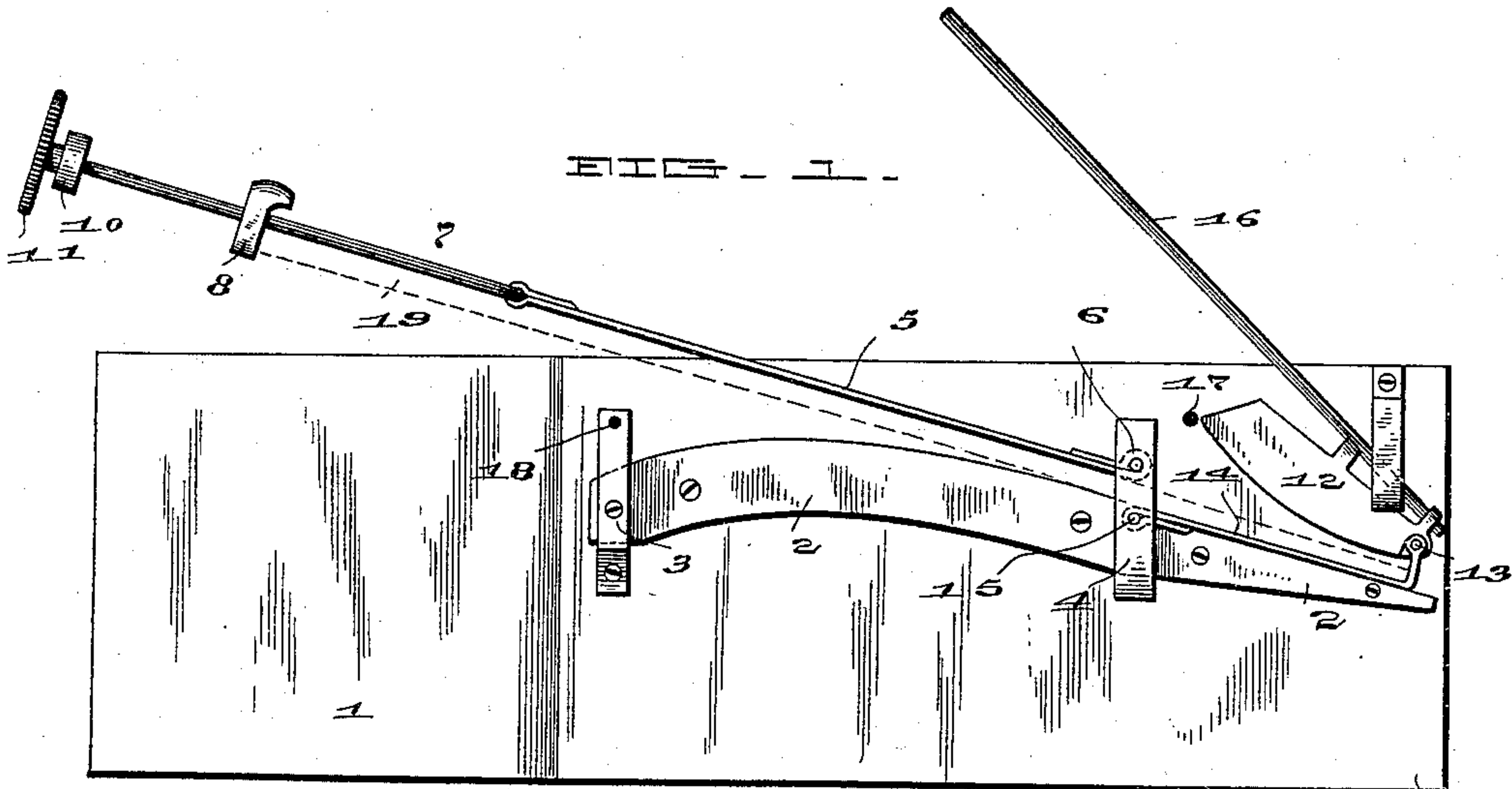


FIG. 2.

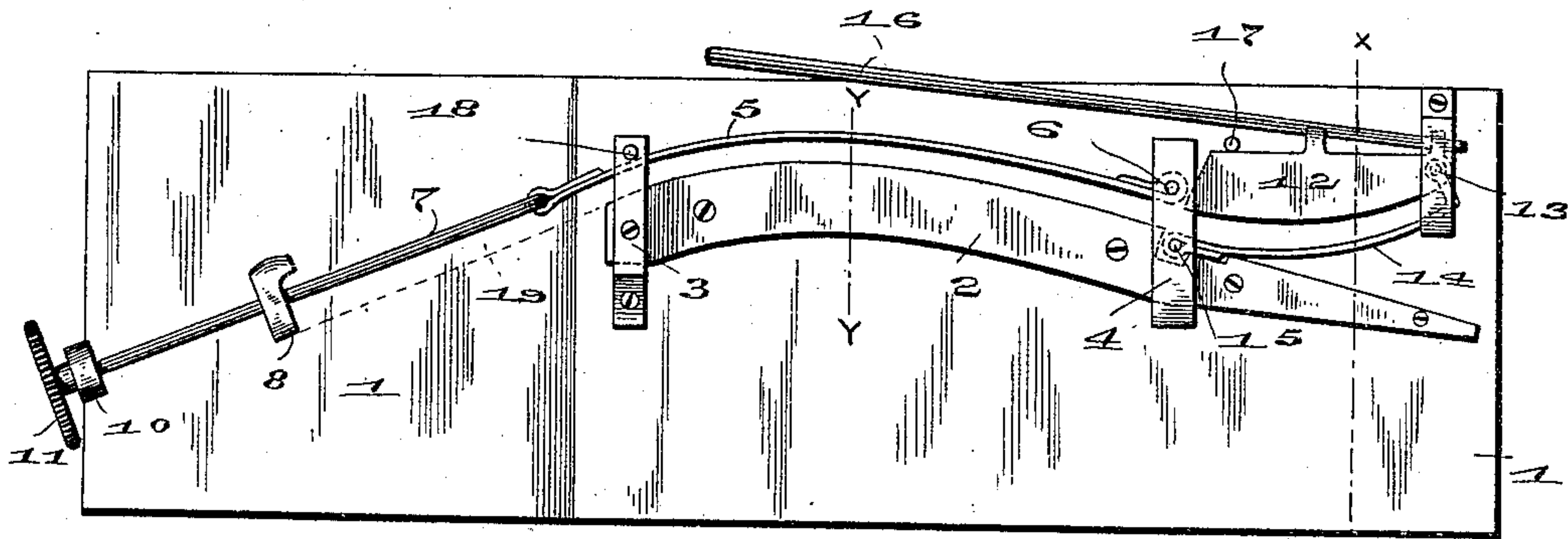


FIG. 4. FIG. 5.

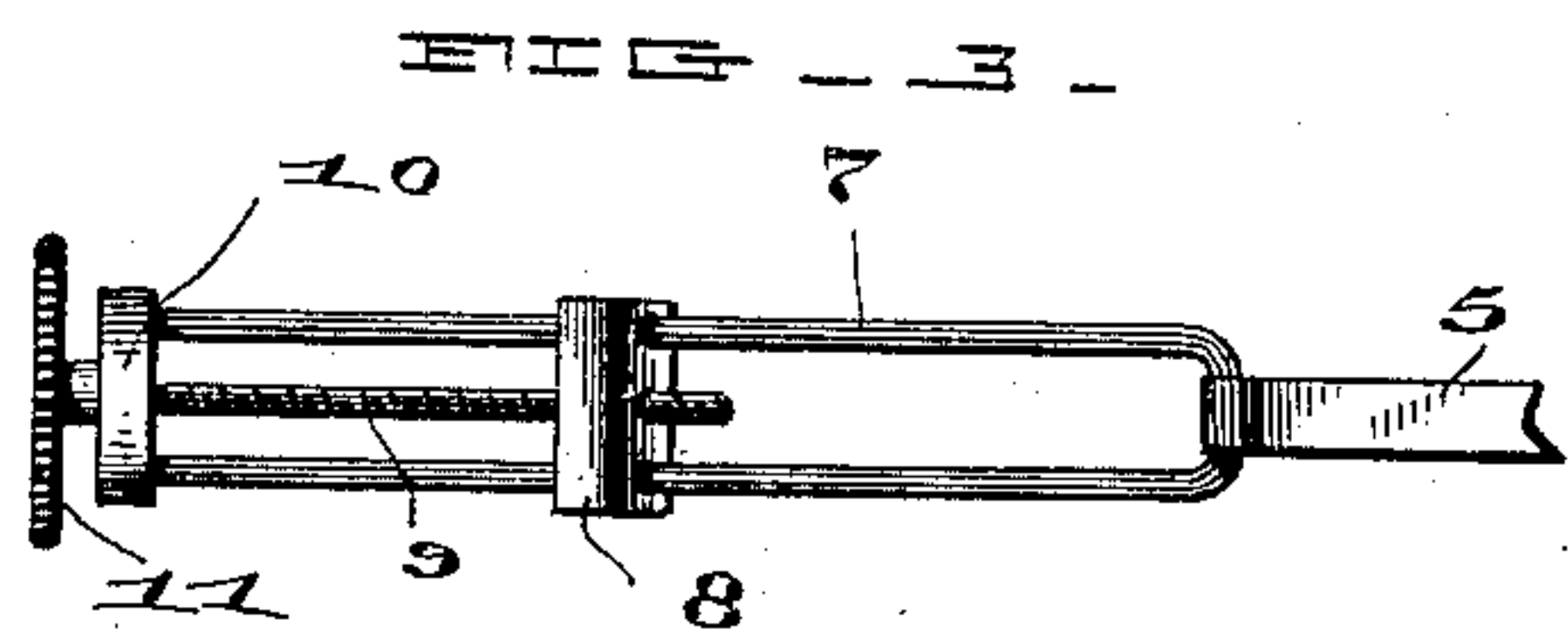
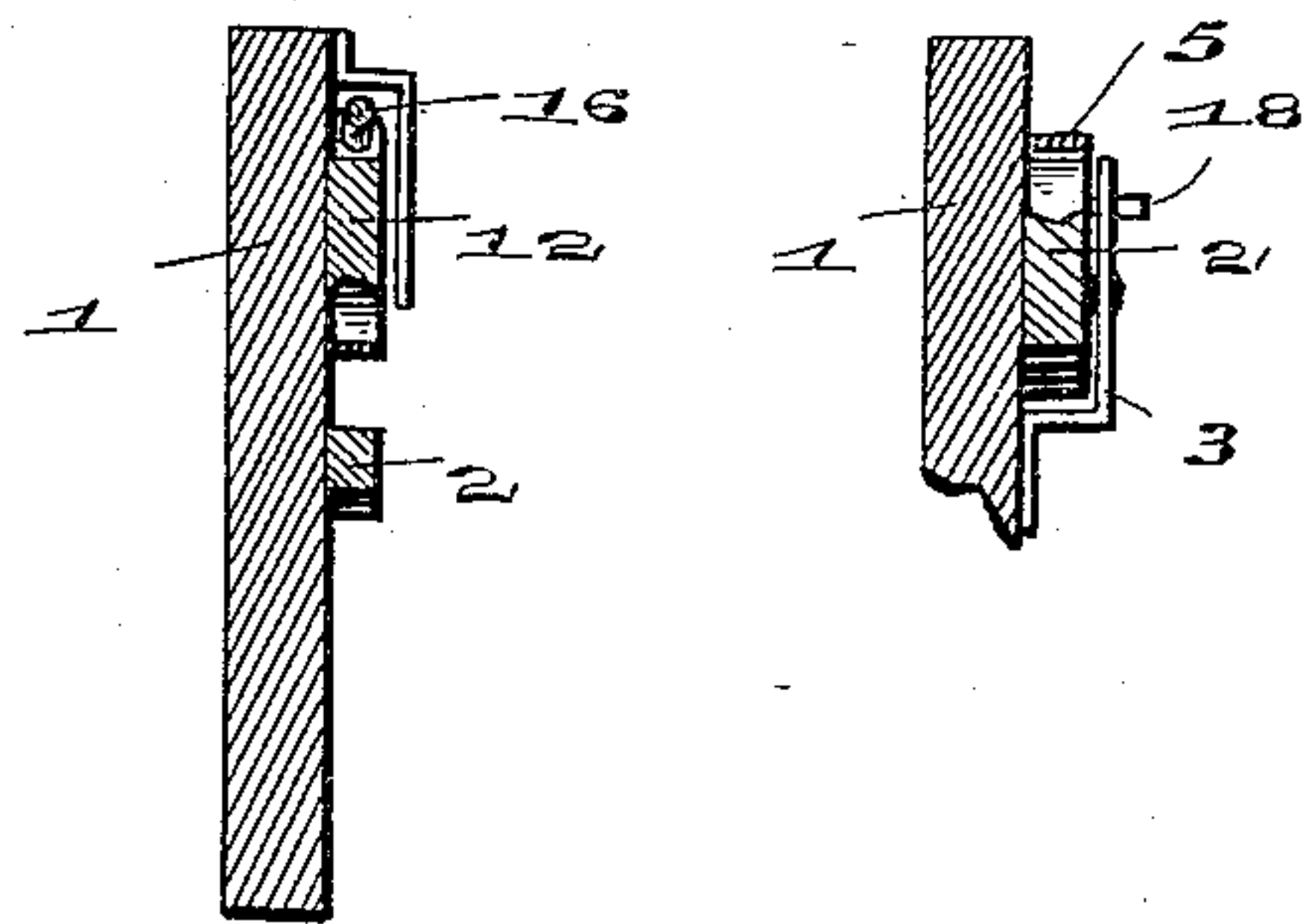


FIG. 3.



Witnesses

J. W. Neely.
E. B. Griffith.

Inventor

Henry Cobb,

By his Attorney
C. P. Jacobs.

UNITED STATES PATENT OFFICE.

HENRY COBB, OF INDIANAPOLIS, INDIANA, ASSIGNOR OF ONE-HALF TO
DWIGHT D. GILLET, OF SAME PLACE.

SHAFT-BENDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 452,339, dated May 12, 1891.

Application filed October 29, 1890. Serial No. 369,747. (No model.)

To all whom it may concern:

Be it known that I, HENRY COBB, of Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Shaft-Bending Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like figures refer to like parts.

My invention relates to the construction of devices for bending vehicle-shafts, and is so arranged that a double bend may be made in the same shaft by one and the same operation, and it will be understood from the following description.

In the drawings, Figure 1 is a side elevation of my machine, the dotted lines indicating the position of the shaft-blank before it is bent. Fig. 2 is a similar view showing the double bend formed in the shaft-blank. Fig. 3 is a detail under side view of the clamp for holding the rear end of the shaft. Fig. 4 is a section on the line *x x*. Fig. 5 is a section on the line *y y*, Fig. 2.

In detail, 1 is a heavy plank, which forms the base or frame-work of the machine.

2 is a forming-block bolted to the side of the frame and confined between straps 3 and 4, bolts passing through these straps and the forming-block into the frame.

5 is a flexible arm pivoted at 6 to the frame, and at its outer end is attached a clamp 7, carrying a movable block 8, against which the rear end of the shaft abuts while being bent, this block being threaded to receive a screw 9, which also works through a threaded opening in the end 10 of the clamp-frame.

11 is a hand-wheel for operating the device.

12 is a second forming-block for bending the outer end of the shaft, which is pivoted at 13 to the upturned flexible end of the arm 14, as shown in Fig. 2, and its inner end pivoted at 15 through the block 2 to the frame.

16 is a lever connected to the block 12 for operating it.

17 and 18 are holes to receive pins for locking the levers when the shaft has been bent. The lower edge of the forming-block 12 is grooved, the sides being of unequal length, the outer being longest, as shown in Fig. 4. The

upper edge of the block 2 is also grooved, its sides being of unequal length; but this inequality is the reverse of that in the block 12, and is shown in Fig. 5, the reason whereof will presently be explained.

19 is the shaft-blank, (represented in dotted lines in Figs. 1 and 2.)

My device operates as follows: The shaft-blank, after having been sufficiently steamed, is set in the machine in the position shown in Fig. 1, its forward end passing behind the strap 5 and abutting against the upturned end of the arm 14 and beneath the forming-block 12 and on top of the forming-block 2. The operator then turns up the clamp 7 by means of the hand-wheel 11 until the block 8 abuts against the lower end of the shaft-blank, clamping the ends thereof firmly between the block 8 and the upturned end of the flexible arm 14. He then pulls down upon the clamp 7, which operates as a handle for the flexible arm 5, and the main body of the shaft-blank is bent between this arm and the forming-block 2, taking the position shown in Fig. 2, and a pin is then inserted in the hole 18, holding the lever down in place. The operator then takes hold of the upper lever 16, pulls it down in the position shown in Fig. 2, and inserts a pin in the hole 17 over the top of the block, holding it securely in place, and a double curve is thus formed in the shaft, as shown in the drawings.

The object of making grooves in the edges of the forming-blocks whose sides are of unequal length and reversed with respect to each other, is this: A shaft-blank in a machine of this kind is bent in two directions—that is, the outer end or top will be bent in a direction opposite to the main bend in the body, and is also given a sidewise twist or bend for the purpose of forming a swell in the shaft at about the point where one bend connects with the other. Heretofore in making bends of this kind two sets of forms have been used having reverse grooves, each shaft being bent upon its own machine, while I produce the complete result by a single operation and in the same machine. This I believe to be new. By clamping the shaft-blank between the upturned end of the arm 14 and the block 8 I bring an endwise strain upon it,

and in bending it is necessary to clamp the shaft-blank endwise in order that the inner or short side of the wood may be upset instead of stretching the wood on the outer or longer side, and this prevents the wood from splintering and destroying the blank. The forms 5 and 14 are made flexible, so that they will accurately conform to the shaft during the process of bending, and there will be no irregularity in the curves when formed.

What I claim as my invention, and desire to secure by Letters Patent, is the following:

1. In a shaft-bending machine, a frame-work, a curved forming-block rigidly secured thereto, a flexible lever pivoted to an arm above such forming-block and provided with a screw-clamp at its outer end for receiving the rear end of the shaft, a second forming-block pivoted to the frame-work near one end, a lever connected thereto for operating the same, and a flexible arm pivoted below such block, having an upturned end for receiving the outer end of the shaft, all combined substantially as shown and described.

2. In a shaft-bending machine, a frame-work, a pair of forming-blocks thereon, the one above and forward of the other, the lower one rigidly secured to the frame, a flexible lever pivoted to the frame above such block and provided with a clamp for holding the rear end of the shaft, the other forming-block pivoted to the frame and provided with a lever for operating it, and a flexible arm pivoted to the frame below such pivoted forming block, having an upturned end for receiving the outer end of the shaft, the outer edges of such forming-blocks forming reverse curves with reference to each other, and provided with grooves having their sides at different

angles, the angles of the sides of the grooves being also reversed with respect to each other, all combined substantially as shown and described.

3. In a shaft-bending machine, a frame-work, a curved forming-block having a grooved edge rigidly secured thereto, a lever pivoted to the frame above such forming-block and provided with a clamp at its outer end, a second forming-block similarly grooved, pivoted to such frame-work, having a reverse curve with respect to the other, a lever connected thereto for operating the same, and a flexible arm pivoted to the frame below such pivoted block, having an upturned end for receiving the outer end of the shaft, whereby an endwise strain is brought against the shaft while being bent by the forming-blocks, with means for locking the parts in place, all combined substantially as shown and described.

4. In a shaft-bending machine, a pair of forming-blocks having reverse curves and grooved edges, the angles of the sides of the grooves reversed with respect to each other, one rigidly secured to the frame and the other pivoted thereto, levers for operating such forming-blocks pivoted to the frame, and a clamp connected with such levers for bringing an endwise strain against the shaft while being bent, all combined substantially as shown and described.

In witness whereof I have hereunto set my hand this 16th day of October, 1890.

HENRY COBB.

Witnesses:

C. P. JACOBS,
E. B. GRIFFITH.