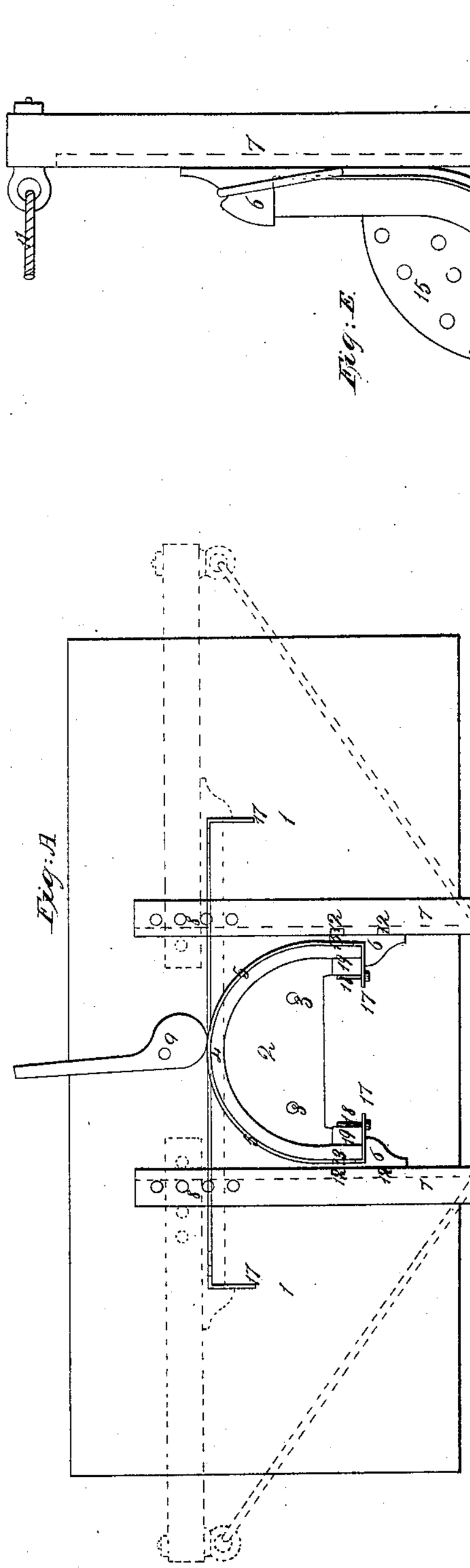
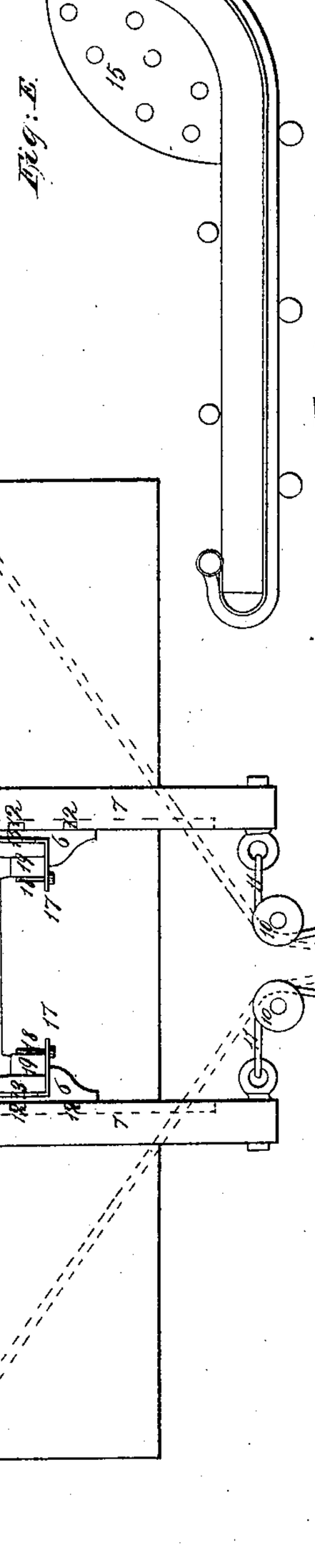
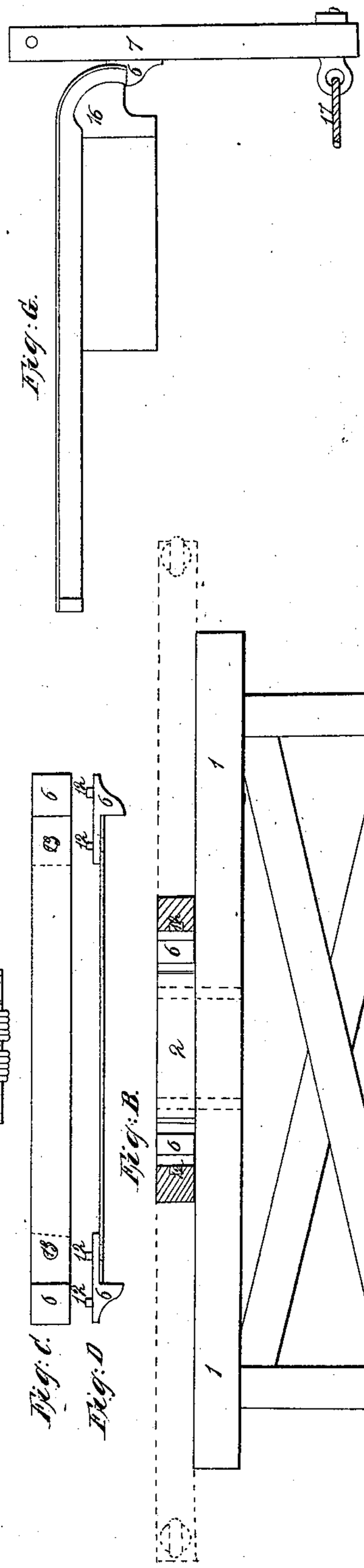
# J. C. Morris,

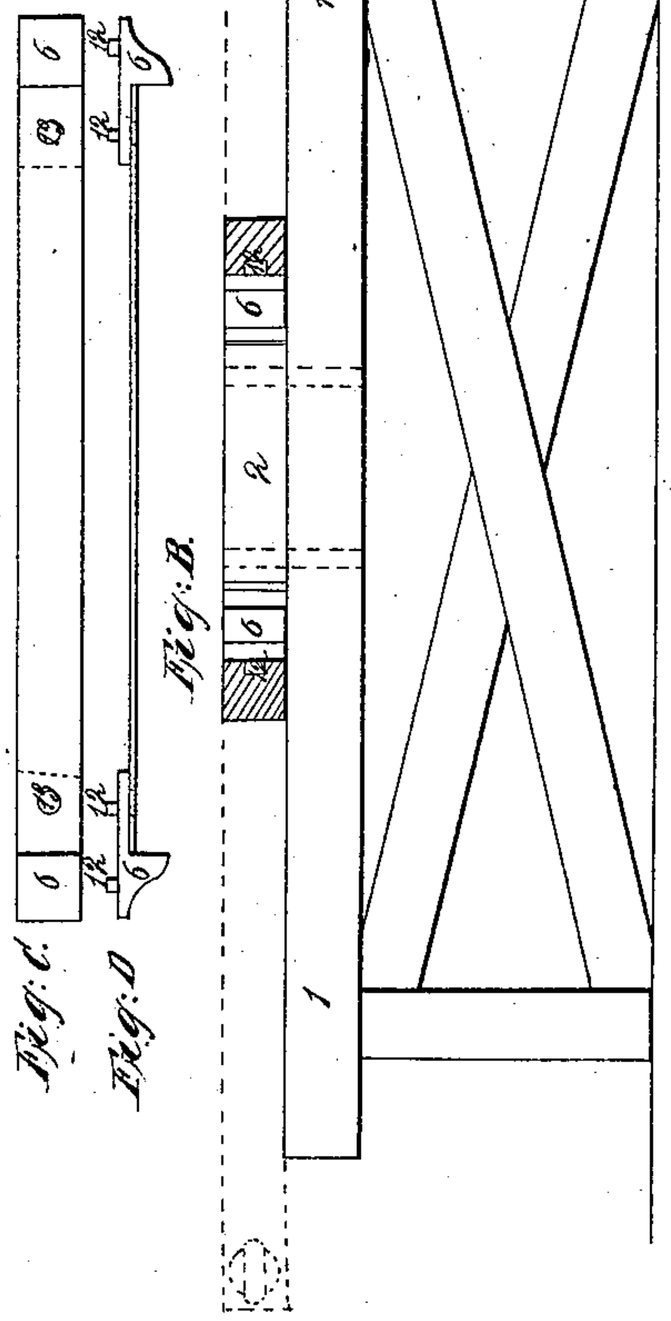
## Bending Wood.

No. 14,405. Patented Mar. 11, 1856.



# UNITED STATES PATENT OFFICE.

JNO. C. MORRIS, OF CINCINNATI, OHIO.

## METHOD OF BENDING WOOD.

Specification forming part of Letters Patent No. 14,405, dated March 11, 1856; Reissued May 27, 1862, No. 1,312.

*To all whom it may concern:*

Be it known that I, JOHN C. MORRIS, of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Machines for Bending Wood for Wagon-Fellies, Ship-Timber, Plow-Handles, Chair-Stuff, and for all other Purposes in which Wood is Required to be Bent; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, and to the figures of reference marked thereon.

Similar figures refer to corresponding parts.

In bending wheel fellies and other articles, around form, levers have been used for bringing the piece to the required shape, by connecting said levers with a strap at each end, the strap being placed at the back of the piece required to be bent, and then drawing the ends of the levers together which bends the piece around the form. But, owing to the levers having the liberty of turning transversely, during the process of bending, which is caused by the tendency wood often has, to twist, from its being harder on one side than the other, or when two or more pieces are bent at once, some are harder than others, and in such cases it is impossible to make true work, and with this method of bending, the ends of the article being bent are not clamped or otherwise held firm, which admits of the piece expanding endwise, and breaking transversely on the outside during the process of bending.

My improvement is intended to remedy the foregoing defects, and yet employ levers to effect the bending, and consists in working the levers on axes which deprives them of all transverse motion during the operation of bending, and brings the piece being bent fair against the form; clamps are then placed on and against the ends of the piece being bent, and connected together, which prevents an expansion endwise, or breaking of the piece, while bending, and the said clamps lie against the sides of the levers, and as the levers are brought together, the clamps will slip on the levers to allow the piece being bent to accommodate itself to the form desired, and thus make a true piece of work, and prevent end expansion and breaking in the process of bending.

My improvement is applicable to bending wood for all and any purposes, such as ship timbers, wheel-fellies, plow handles, chair-stuff, and other articles not here mentioned. In some cases, but one lever will be required, such as bending plow-handles.

To enable others skilled in the art to make and use the improvement, I will proceed to describe its construction and operation by referring direct to the accompanying drawings.

Figure A, represents a top view of the table to which the bending apparatus is attachable. Fig. B, is a side elevation of the same. Figs. C, and D, are different views of the strap and clamps placed at the back and ends of the piece being bent. Figs. E and G show the application of the improvement as applied to the bending of ship-timber and plow handles, when but one lever is used.

1, 1, represents the table on which the form 2 rests, and held to its place by the pins 3, 3. The form is made to suit the shape required to be bent. In the present instance there is one placed on the table for bending wagon fellies.

4, represents the felly.

5, is an iron or steel band. The clamps 6, are attached at the ends by pins 13 projecting from the clamps and made to pass through holes made through the ends of the straps.

7 are the levers working on the fulcrum 8, and are operated by the drum 14, and cords 11, the drum being worked by hand with a crank, or by application of power otherwise. The cord is made to pass around the friction rollers 10 and operated substantially as represented in Fig. A. As the levers 7 are drawn together in the process of bending, the clamps 6, connected to the strap 5, are made to slip against the sides of the levers to allow the piece being bent to accommodate itself to the form 2, and the levers working on the fulcrums 8, prevent it from twisting or having any transverse motion, thereby causing the piece to be brought fair against the form and thus make a true piece work.

12, 12, are tongue pins attached or cast to the back of the clamps 6, and work in grooves made in the inside of the levers to

prevent the clamps from slipping laterally, or otherwise becoming deranged from their proper relative position to the levers during the bending operation.

9, is an eccentric clamp, for holding the wood and strap to the form when first put in the machine, after which the piece is operated upon by the levers 7, cords 11, and drum 14, as fully represented by the drawing and dotted lines in Fig. A.

It is often the case that two or more pieces will be bent at one time, and will be laid together as shown in Fig. H, and placed in the machine to be operated upon by the levers as before specified.

In Fig. E, the improvement is applied to bending timber for ship building, and represents its application to bending a knee for the hull of a vessel, one end of the timber being properly held between stay rods, while the opposite end is bent around the form 15, by the improved working lever 7 and clamp 6. In such cases, but one lever and clamp is used.

Fig. G, represents the improved apparatus, applied to the bending of plow handles around the form 16. The piece forming the plow handle will be held by any suitable means while being bent.

In bending wagon fellies, as the piece is laid against the strip and between the clamps as shown in Fig. A, hooks 17, provided with pin holes, will be placed at the ends of the wood, for holding the piece after being bent, to the form, by passing the pins 18 through the holes in the hooks 17, and having the pins to come on the inside of the catch 19, which will commonly be a part of the form, and thereby holds the piece bent to the form. The strap and clamps are taken from the felly and the form 2 is raised from the table and placed between two pieces of timber, which holds the felly to the form, after which the catch hooks 17, and pins 18 are taken from ends of the felly, and a strip of wood nailed across to hold it to its proper shape. The felly or fellies are then taken off of the form which completes them, and the form is again ready to be placed on the table for operation.

What I claim as my improvement and desire to secure by Letters Patent is—

The clamps 6, 6, to prevent end expansion and the levers 7, 7, working on fixed fulcrums when in operation, all substantially as, and for the purposes set forth in the foregoing specifications.

JOHN C. MORRIS

Witnesses:
MARTIN BENSON,
L. W. SMITH.

[FIRST PRINTED 1912.]