J. D. Sarren,

Bending Wood.

No. 16,453. Patented Jan. 20, 1857.

Fig. 1

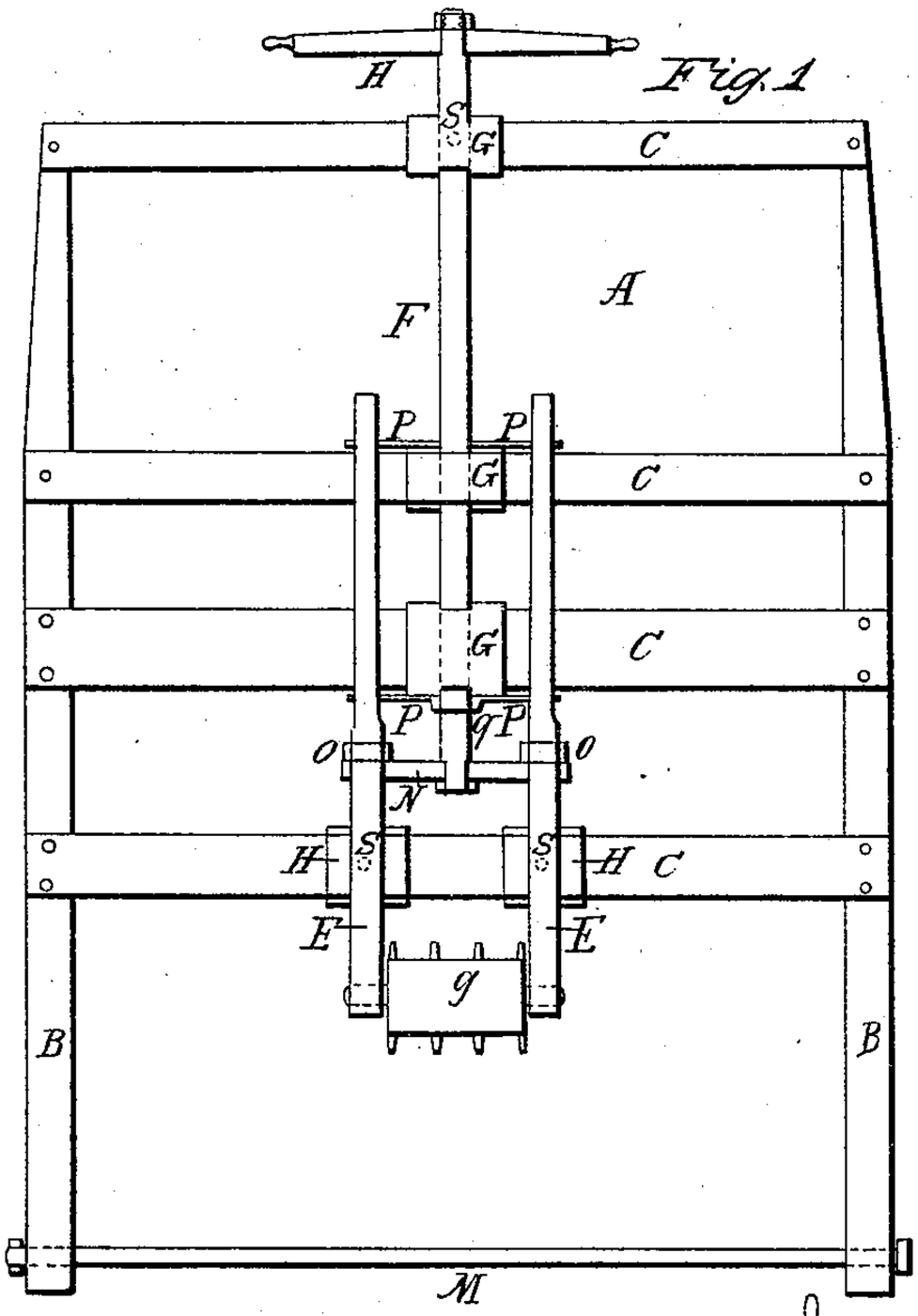

Fig. 2

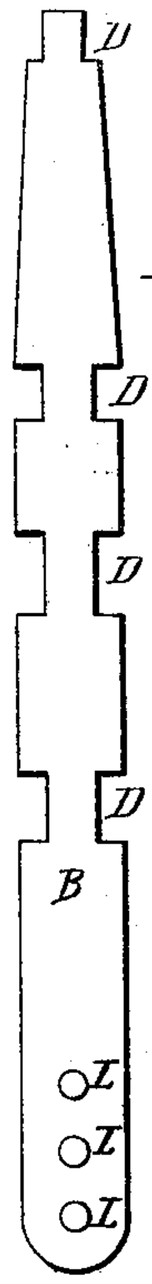

Fig. 3

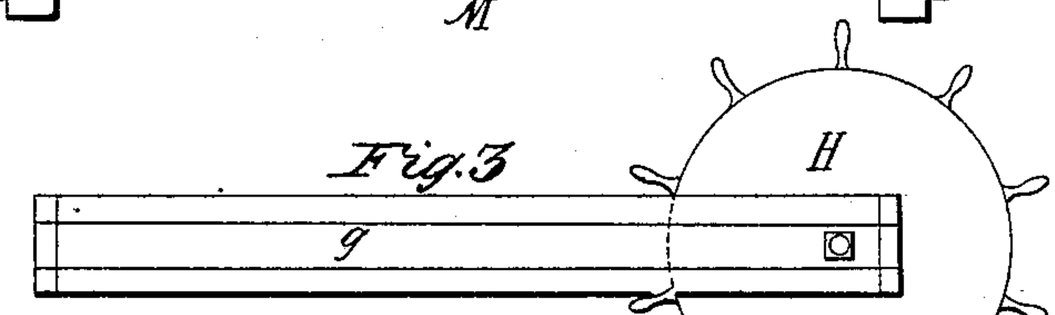

Fig. 4

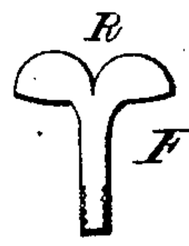

Fig. 6

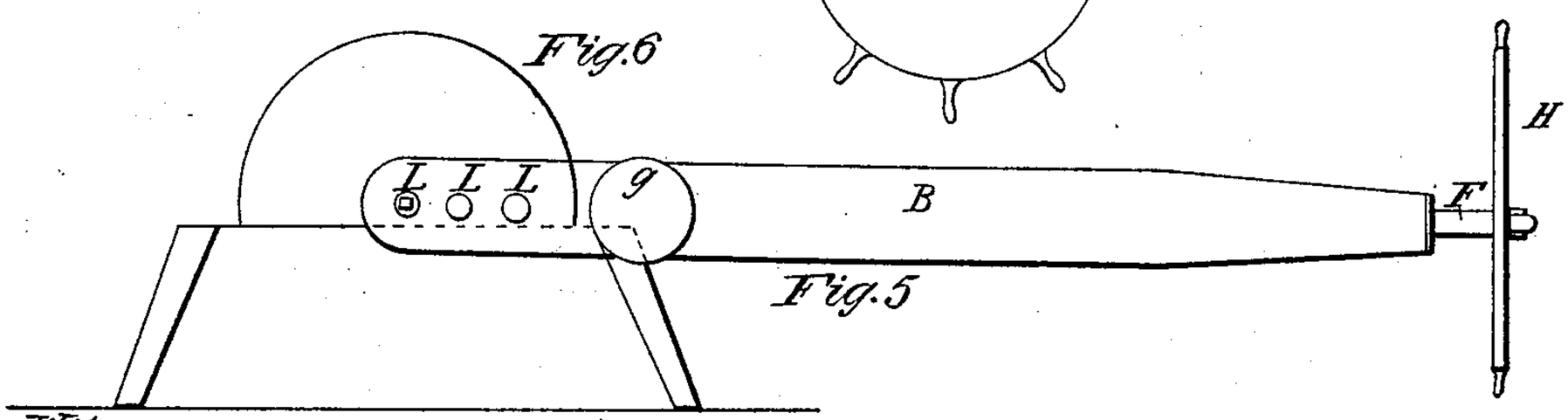

Fig. 5

Witnesses:
W. F. Southern
W. Wood

Inventor:
James D Sarren.

UNITED STATES PATENT OFFICE.

JAMES D. SARVEN, OF COLUMBIA, TENNESSEE.

MACHINE FOR BENDING TIMBER.

Specification of Letters Patent No. 16,453, dated January 20, 1857.

To all whom it may concern:

Be it known that I, JAMES D. SARVEN, in the county of Maury, in the State of Tennessee, have invented a new and Improved Machine for the Purpose of Bending Timber in Regular or Irregular Forms or Curves; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon.

The nature of my invention consists in the employment of a revolving frame or frames in combination with a bending roller as herein described for the purpose of bending timber in regular forms or curves by means of the roller pressing firmly upon the timber to be bent thereby preventing the fibers of the timber from separating and also for the purpose of bending timber in irregular forms or curves.

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

A, Fig. 1, is a bending frame consisting substantially of side lever bars B, B, and cross bars, C, C, C, C.

B, Fig. 2, is a side view of lever bars. D, D, D, D are recesses to receive the cross bars, one cross bar, directly opposite the other on each side of lever bars and extending from one lever bar to the other and bolted firmly thereon thereby connecting the whole together allowing space between the cross bars for the roller guides, E E, and regulating rod F to slide from one side of the bending frame to the other carrying with them the slides, G, G, G, and H, H, also the bending roller I.

I Fig. 3 is a top view of bending frame showing the lever wheel K at one side of frame.

L, L, L, Fig. 2, are openings in side lever bars to admit the rod, M, Fig. 1 to pass through. The different openings being for the purpose of altering the distance between the rod, M, and the bending roller I, in bending timber such as fellies for a wheel of large diameter the rod is inserted in an opening farther from the bending roller than for one of small diameter. The rod M also passes through the mold on which the timber is bent openings being made in the mold for that purpose it being the rod on which the bending frame A revolves when in the act of bending timber.

I Fig. 1 is a bending roller secured in its position by a gudgeon in each end passing through the roller guides, E, E. The roller is made with any desired number of flanges according to the number and size of the pieces of timber it is desired to bend at the same time by which means every piece is bent perfectly true being free from windings to one side or the other.

E, E, Fig. 1 are roller guides passing through openings in the connecting plate, N, near the end of plate a shoulder being made on the guides at the under side of plate and a thread cut on the guides above the upper side of plate and nuts, O, O, being fitted thereon and screwed firmly down to the plate secures the guides firmly in their position, the guides also extend up to and pass through openings in steadying plates, C, C, which prevents the bending roller from swerving out of its true position the openings being of such size as to allow the roller guides to move up and down when the lever wheel is turned.

N is a connecting plate in which there are openings near each end through which the roller guides pass. There is also an opening in the center of plate through which the regulating rod F passes and into which the rod is fastened but is allowed to turn in order to raise and lower the bending roller, I, when the regulating rod is turned by means of the lever wheel, K.

F Fig. 1 is a regulating rod passing through openings in the slides, G, G, G, and through the slide nut *q* a thread being cut on the rod and a corresponding thread in the slide nut, by which means the bending roller is raised or lowered by turning the lever wheel K.

q Fig. 1, is a slide nut firmly attached to the slide G, and is moved with the slide from one side of the bending frame to the other.

G, G, G, are slides passing entirely around the cross bars with openings through which the regulating rod F passes, the slides being made so they can move from one side of the bending frame to the other with the regulating rod F and bending roller, I. H, H, Fig. 1 are slides constructed in the same manner and through which the roller guides E, E, pass.

K, is a lever wheel secured firmly on the

regulating rod F and by which the rod is turned, in order to raise or lower the bending roller.

P, P, are steadying plates firmly attached to slides, G, G, with openings near each end through which the roller guides C, C, pass.

R Fig. 4, represent thumb set screws, a thread being cut into slides H H and G Fig. 1 as shown by S, S, S, into which the screws are fitted and their ends when screwed against the plates of iron which are fastened to the cross bars, C, C, prevent all lateral play of the slides and bending roller while the timber is being bent.

In constructing a machine to be operated by hand for a heavy class of work, I make the lever bars and cross bars of hard wood. The lever bars I make in general 7 ft. 6 in. long, $5\frac{1}{4}$ in. wide and $1\frac{3}{4}$ in. thick tapering them gradually from the cross bars next below the top bars up to the ends of lever bars leaving them at that point $1\frac{1}{4}$ in. thick and $3\frac{3}{4}$ in. wide, the cross bars on which the slides H H are made to move I make $2\frac{1}{2}$ in. wide and 2 in. thick, the cross bars on which the slide nut *q* is made to move I make 3 in. wide and 2 in. thick the cross bars at top of frame I make 2 in. wide and $1\frac{5}{8}$ in. thick and on the outside surface of all these bars I screw a piece of iron the length and width of bars and $\frac{1}{4}$ in. thick the bars next below the top bars I make $2\frac{1}{4}$ in. wide and 2 in. thick and do not support them by irons. The lever wheel I make of hard wood 16 in. in diameter and $1\frac{5}{8}$ in. thick and insert hard wood pins in its outer circumference at convenient distances for the purpose of turning the lever wheel. The bending roller I make of iron $3\frac{3}{4}$ in. in diameter independent of the flanges which project $\frac{7}{8}$ in. beyond, there being a number of rollers of different distances between the flanges in order to correspond with the width of the timber to be bent, the whole length of all the rollers being the same in order to fit between the roller guards E, E, which distance in general is 6 in. and in order to remove one roller for the purpose of inserting another the nuts O, O, Fig. 1, are unscrewed the roller guards, C, C, are withdrawn and the desired roller inserted the guides are then replaced, the roller guards I make of iron $1\frac{5}{16}$ in. in diameter below the connecting plate and 1 in. where it passes through the plate and nuts, O, O, above this point I make them $\frac{7}{8}$ in. the connecting plate, I make of iron $\frac{7}{8}$ in. thick and 2 in. wide, the regulating rod I make of iron 1 in. in diameter, the slides $3\frac{1}{4}$ in. wide of iron and $\frac{1}{4}$ in. thick except at the points, S, S, S, Fig. 1 where the thumb set screws are fitted where they are $\frac{3}{4}$ in. thick, the steadying plates I make of iron $1\frac{1}{2}$ in. wide and $\frac{3}{8}$ in. thick.

To bend timber in regular curves such as fellies for a carriage wheel the rod M Fig. 1 is inserted as described already, the bending frame is then brought to the position shown in Fig. 5 the thumb set screws are tightened by means of their ends being screwed firmly against the plates of iron which are fastened to cross bars, C, C, the prepared material is now inserted and their ends firmly held in a groove the lever wheel is then turned until the bending roller presses firmly against the timber to be bent, the bending frame is then raised by means of the lever bars, B, B, and made to revolve around the mold as far as necessary to perfectly bend the timber their ends being firmly fastened by any of the usual modes the lever wheel K is turned and releases the bending roller from pressing on the bent timber, the bending frame is then brought back to its former position the thumb set screws loosened and the bending roller is moved off the bent timber by means of the slides by placing one hand against the regulating rod and the other against one of the roller guides and gently pressing the same. The thumb set screws being again tightened another set of timbers are bent in the same manner and these operations are repeated until the mold is filled with bent timber the rod, M, is then withdrawn and the bending frame can be attached to any number of molds required.

The bending machine may be operated by any desired power the length of lever and strength of material used in its construction to correspond with the power employed and the work to be performed.

To bend timber in irregular forms or curves the bending frame may be made to revolve the same as in bending fellies as described and shown in the accompanying drawing. Fig. 6 being the mold on which the timber is bent but the lever wheel K is turned while the frame is revolving in order to raise or lower the bending roller I, Fig. 1, for the purpose of overcoming any irregularities of the mold thereby causing the pressure of the roller upon the timber to be the same regardless of the shape of the mold, where it is necessary to bend only a small portion of the timber and at considerable distance from each other such as bows for carriage tops where the corners only are bent a slot or other convenient arrangement may be used instead of the rod, M, in order that the bending frame may be quickly and conveniently removed from one corner of the mold to the other, or 2 bending frames may be used one at each corner of the mold where it is desirable to expedite the work. The bending frame may also be attached to framework independent of the mold and instead of revolving on the rod, M, Fig. 1, as described it may be pivoted on such frame work and revolve thereon or made stationary in order to be used in

combination with a revolving mold or a mold moving in a horizontal direction.

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

1. The bending frame A or its equivalent arranged and operating substantially as herein described and for the purposes herein set forth.

2. I also claim in combination therewith the mechanism and arrangement herein described or other equivalent devices for the purpose of operating the bending roller, I, or its equivalent as herein specified the whole being constructed and made to operate together substantially as herein specified and for the purposes herein set forth.

3. I also claim in combination with the bending frame A or its equivalent the mechanism and arrangement herein described or other equivalent devices for the purpose of bending timber in regular or irregular forms or curves if the same is used in combination with a revolving mold or mold operating or arranged in any other manner.

JAMES D. SARVEN.

Witnesses:
W. F. SOUTHERN,
WM. WOOD.