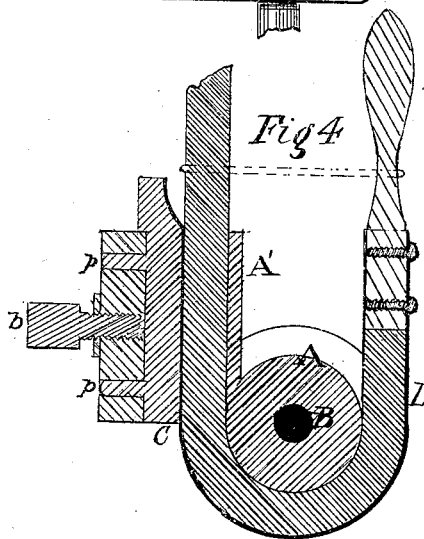
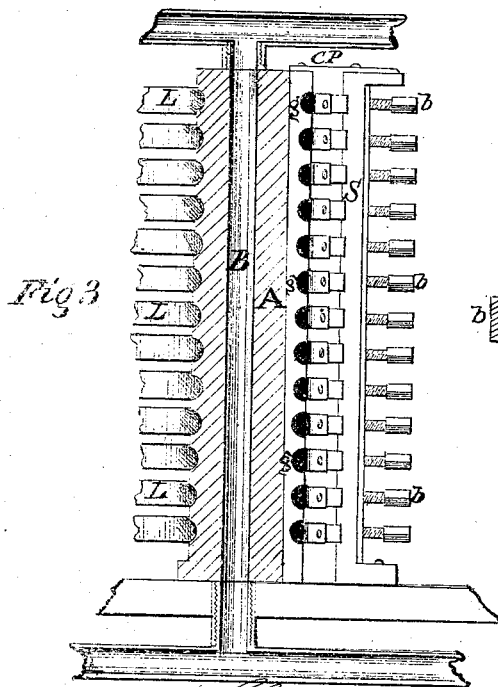
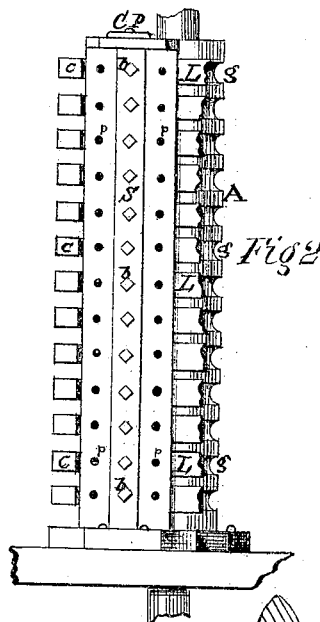
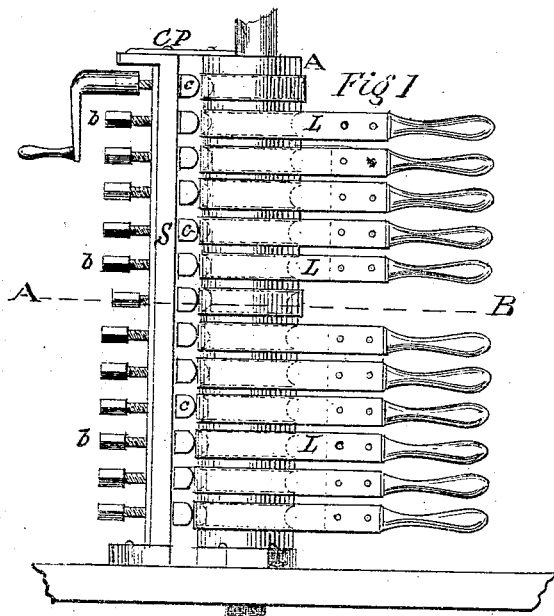


*J. M. Michael,*

*Bending Wood.*

*No. 110262.*

*Patented Dec. 20. 1870.*



Witnesses

*Charles Evans*  
*Frank Stout*

*Inventor*

*John M. Michael*  
By his Attorney—  
*Joseph H. Cobbuck*

# UNITED STATES PATENT OFFICE.

JOHN McMICHAEL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO  
WRIGHT BROTHERS & CO., OF SAME PLACE.

## IMPROVEMENT IN MACHINES FOR BENDING WOOD.

Specification forming part of Letters Patent No. 110,262, dated December 20, 1870.

*To all whom it may concern:*

Be it known that I, JOHN McMICHAEL, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Machines for Bending Umbrella-Sticks, Canes, &c., of which the following is a specification.

It is a well-known fact that umbrella-sticks and canes, or sticks to be used for these purposes, have been bent out of square, round, or sticks first sawed square and then rounded on two corners before bending into the desired shape.

My invention is made with reference to facilitating the process of bending, reducing the space required to turn out a large quantity of hooks, and reduce the expenses of bending or manufacturing them.

My invention consists in the combination of a grooved upright, heated by steam, with spring-levers and screw-clamp, in order that large quantities of umbrella-sticks or canes can be curved at any desired angle in a short space of time and at a small expense.

Figure 1 is a front view of my machine. Fig. 2 is a side view of same, with spring-levers broken and detached. Fig. 3 is a back view of Fig. 2, with the cylinder cut at right angles, in order to show the interior of same. Fig. 4 is a sectional view of Fig. 1 on the line A B.

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

I construct a grooved upright, A, of any suitable metal, and in the form as shown in Figs. 1, 3, and 4. In the center and passing through lengthwise is a cylindrical or other shaped opening, B, for the passage of steam. On the face of the cylinder A, commencing from the extended part A' of the cylinder, are a series of curved grooves, *g g g*, which extend around the cylinder and across the part A', as shown in Fig. 3. A short distance from the side of the cylinder A and extended part A' is a metallic standard, S, as shown in Figs. 1, 2, and 3, between the said standard, being secured on top of the table by means of base-piece, through which passes screws or bolts, and at the top is held rigidly by means of a

cross-piece, C P, secured on top of the standard and cylinder. In the space between the cylinder A and the standard S, and immediately opposite each groove in the cylinder, is a series of movable clamps, *c c c*. On the face of said clamps are secured a number of spring-levers, L L L, which extend out and beyond the cylinder A, and are provided with suitable handles, as shown in Figs. 1 and 4. On the back part of the clamps *c c c* are cast or formed guides or pins *p p*, said guides or pins passing through suitable openings in the standard S, as shown in Figs. 2 and 4. In the center of the standard S, and immediately opposite the clamps *c c c*, are cut openings, the interior of which is provided with a thread. Passing through the said opening is a series of screw-bolts, *b b b*, for forcing the clamps *c c c* against the sticks or canes to be bent, and retaining them firmly in place.

In operating my machine the steam is turned on, and enters the pipe B through suitable steam-fittings. The ends of the canes or sticks to be bent are placed in a tank or any other suitable vessel, when the steam is admitted, in order to sufficiently soften them. The sticks are then placed by the operator in the grooves between the cylinder and the clamps, with the steamed end to be bent in contact with the flat or lower end of the handle of the spring-lever. The screw-bolts are then screwed up against the clamps by means of a lever or key. The cane is then curled by means of gradual pressure or curving of the spring-lever, which carries around and bends the stick to the desired curve, where it (the stick) is retained in the grooves of the cylinder until dry by means of a hook or rod which extends over the cane and handle of the spring-lever, as shown by dotted lines in Fig. 4.

I do not desire to limit myself to simply a circular opening through the center and length of the grooved cylinder A, as the opening for steam can be made large, and assume somewhat the form of the exterior of the cylinder, in order that the grooves in the cylinder can be heated to a greater degree, and thus dry the sticks or canes more rapidly.

I am aware of the patent issued to Henry Winter, under date of May 3, 1870, for bend-

ing-machine, and therefore do not claim any of the devices contained therein.

Having thus described my invention, its construction, and operation, what I claim, and desire to secure by Letters Patent, is—

The grooved cylinder A, constructed as herein specified, in combination with the standard S, clamps *c c c*, spring-levers L L L, and screw-bolts *b b b*, operating substantially as and for the purpose set forth.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN McMICHAEL.

Witnesses:

JOS. H. COPPUCK,  
FRANK STOUT.