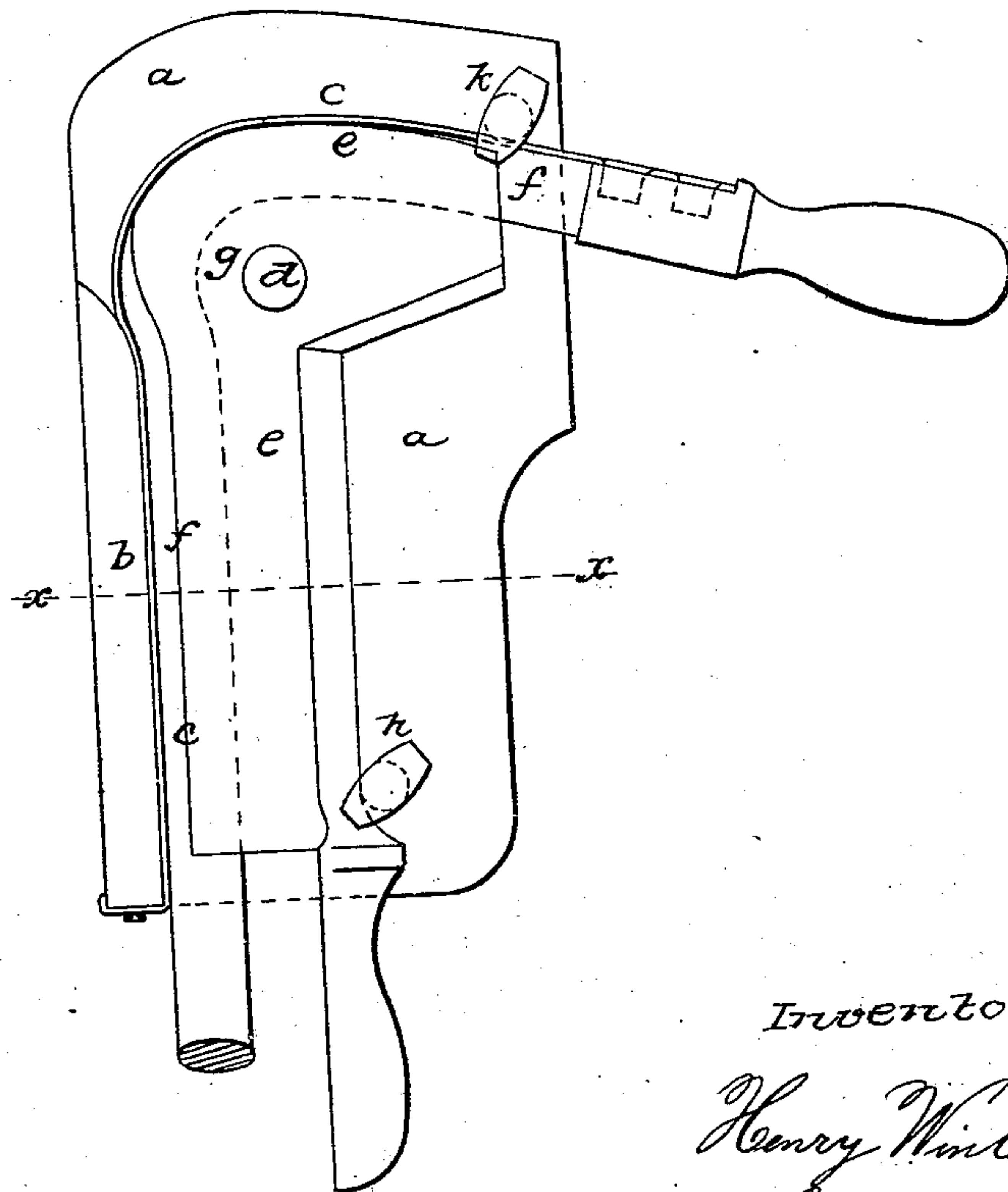
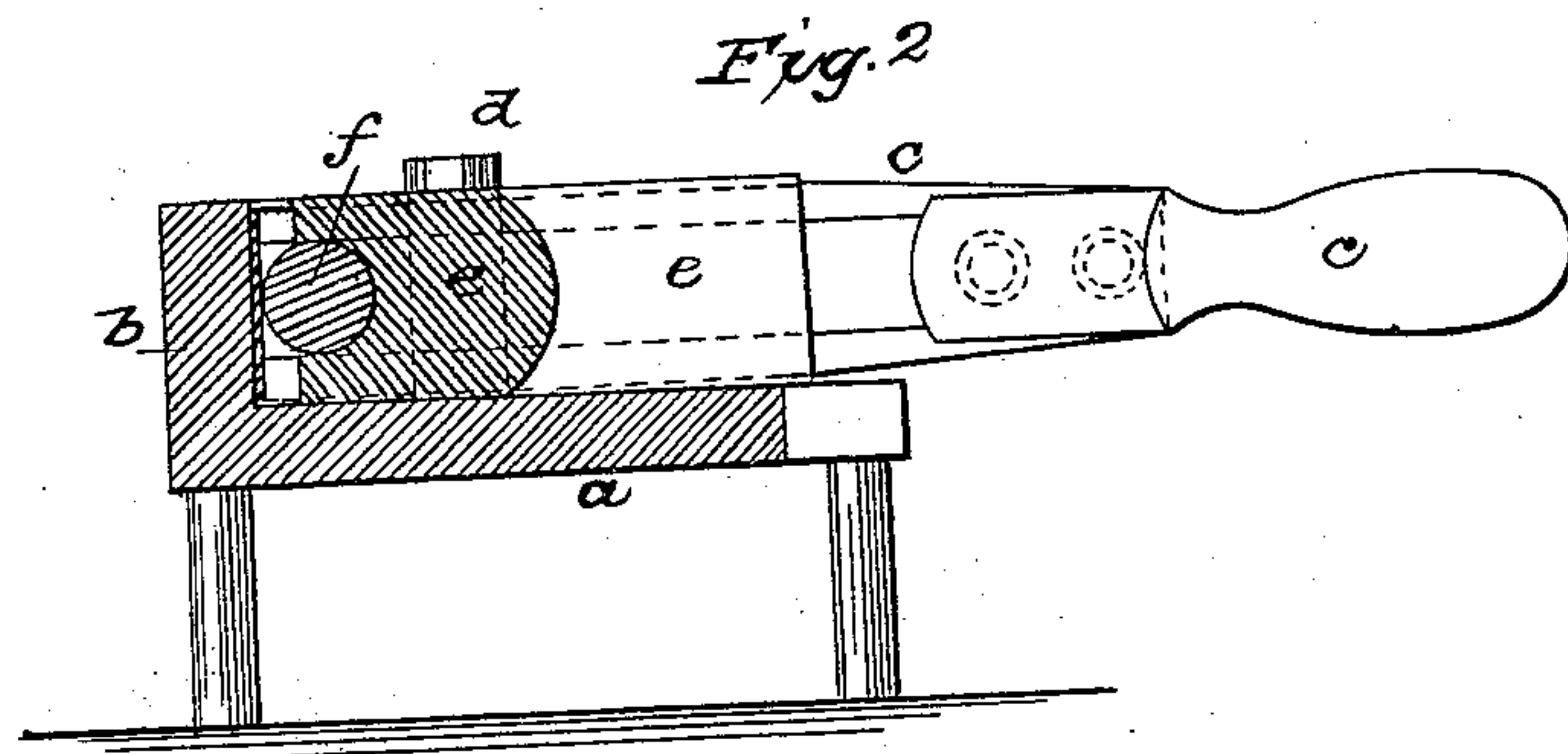


H. WINTER.
Bending Machine.

No. 102,641.

Patented May 3, 1870.



Witnesses
Chas. H. Smith
Geo. J. Walker

Inventor
Henry Winter
per Lemuel W. Searll
Attys

United States Patent Office.

HENRY WINTER, OF HONESDALE, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND THOMAS W. BALL, OF NEW YORK CITY.

Letters Patent No. 102,641, dated May 3, 1870.

IMPROVEMENT IN BENDING-MACHINE

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, HENRY WINTER, of Honesdale, in the State of Pennsylvania, have invented and made an Improvement in Bending Umbrella-Sticks, Canes, &c.; and the following is declared to be a correct description of the same.

The bending of umbrella-sticks and canes has heretofore been attended with considerable difficulty, especially when a round stick of such wood as maple is employed. The shortness of the woody fibre rendered the handle liable to break, and only half round hooks have been thus made, and these were not fully approved in the trade.

My invention is made with reference to the removal of these difficulties, and consists in a peculiar clamping and bending apparatus, that operates upon a round or otherwise nearly finished stick, to give to the same a compound curved or "cross hook" form, while clamped in such a manner that there cannot be any endwise motion or yielding, but the bending will effect an end compression throughout the bent portion, whereas, in the bending-devices heretofore made, the stick was liable to be broken or split in consequence of not being held sufficiently to prevent an end motion while being bent by a compressing-strap

In the drawing—

Figure 1 is a plan of my apparatus; and

Figure 2 is a section at the line *x x*.

The bed *a* of the apparatus is made with a fence, *b*, to which the metallic bending-strap *c* is attached. Said bed *a* also carries the gudgeon *d*, upon which the clamping-mold *e* swings.

The edge of this mold is grooved to receive the cane or stick *f*, and a projection at *g* is made, so that a compound curve or back-set is given to the stick in the act of clamping said stick between the mold *e*, and bending-strap *c*.

A pin, introduced at *h*, holds the mold *e* in place while the bending-strap *c* and cane or stick are bent down to the mold *e*, and retained by a pin inserted at *k*.

It is to be understood that the mold *e* is to be heated, and the stick or cane rendered pliable by steam heat, and I find that, in consequence of the back-set and the compound curve thereby produced, I am enabled to bend umbrella and cane handles with the shape known as the "cross hook," without breaking the fibre of the stick, because the compound curve and the firm hold of the cane by the offset *g* ensure a uniform endwise compression of the entire hook in bending it to shape, whereas, in the bending of semi-circular hooks on the handles, such hooks are liable to break.

One man has a sufficient supply of these bending-clamps to allow the stick or cane to remain in the mold a sufficient length of time to become dry and set before he comes around to that mold, as he operates them in succession.

The fence *b* might be movable, and the mold *e* stationary.

I do not claim the strap *c*, or bending-mold, as a variety of articles have been bent by devices of said character.

I claim as my invention—

The mold herein described for bending canes or sticks, formed of the clamp *e*, with the projection *g*, in combination with the strap *f*, fence *b*, and bed *a*, the parts being constructed and operated substantially as specified.

Signed by me this 3d day of March, A. D. 1870.

HENRY WINTER.

Witnesses:

CHAS. MENNER,
F. L. GRAMBS.