

L.E. MINOTT

Wood Bending Machine

117663

PATENTED AUG 1 1871

Fig. 1

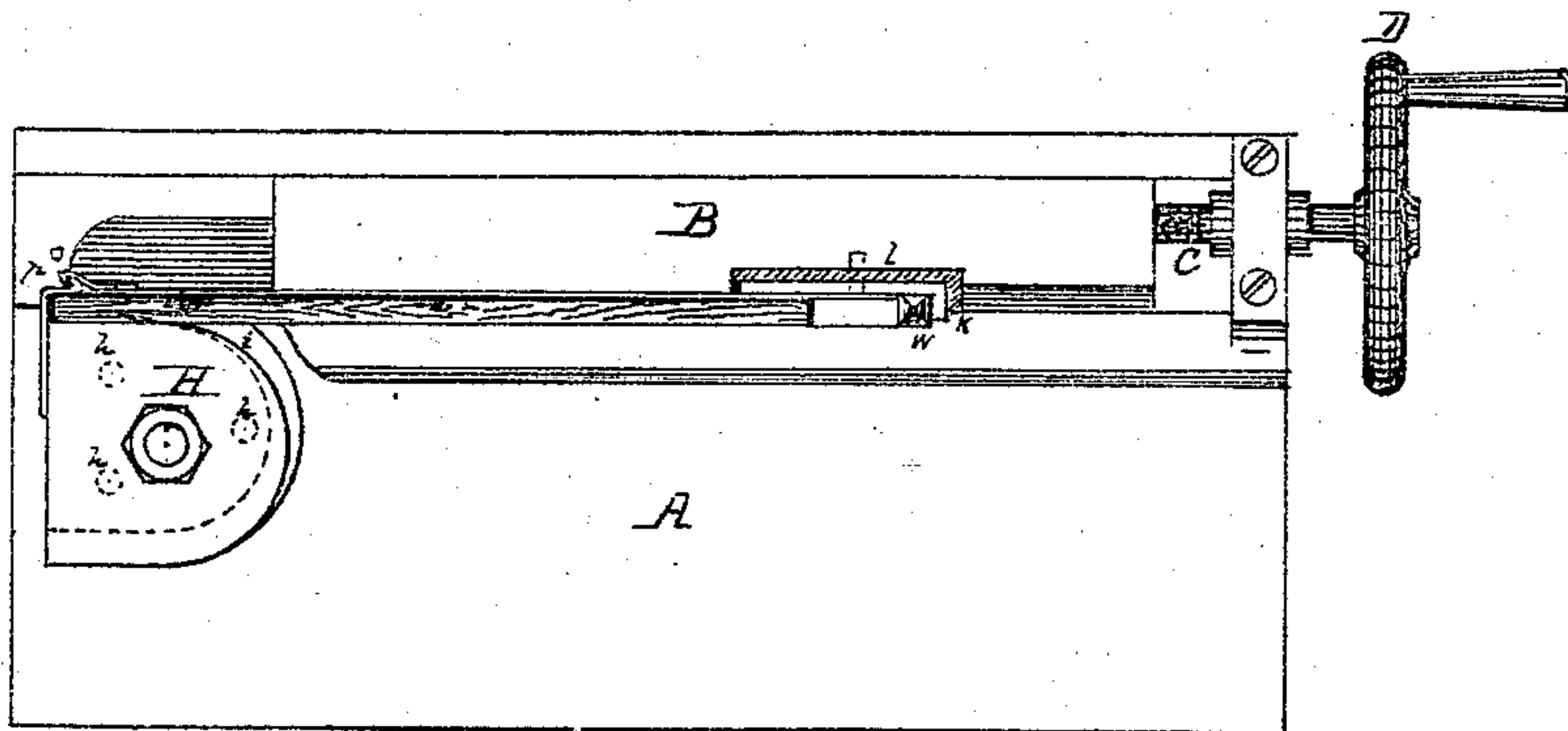


Fig. 2

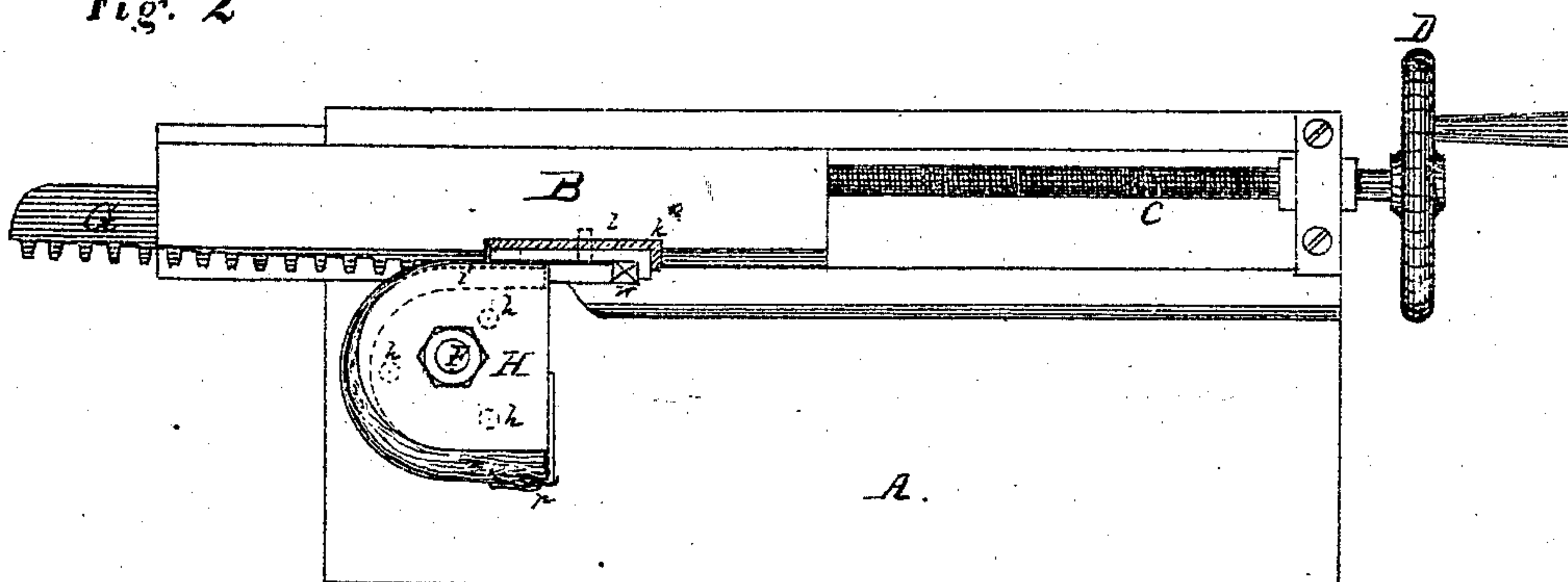
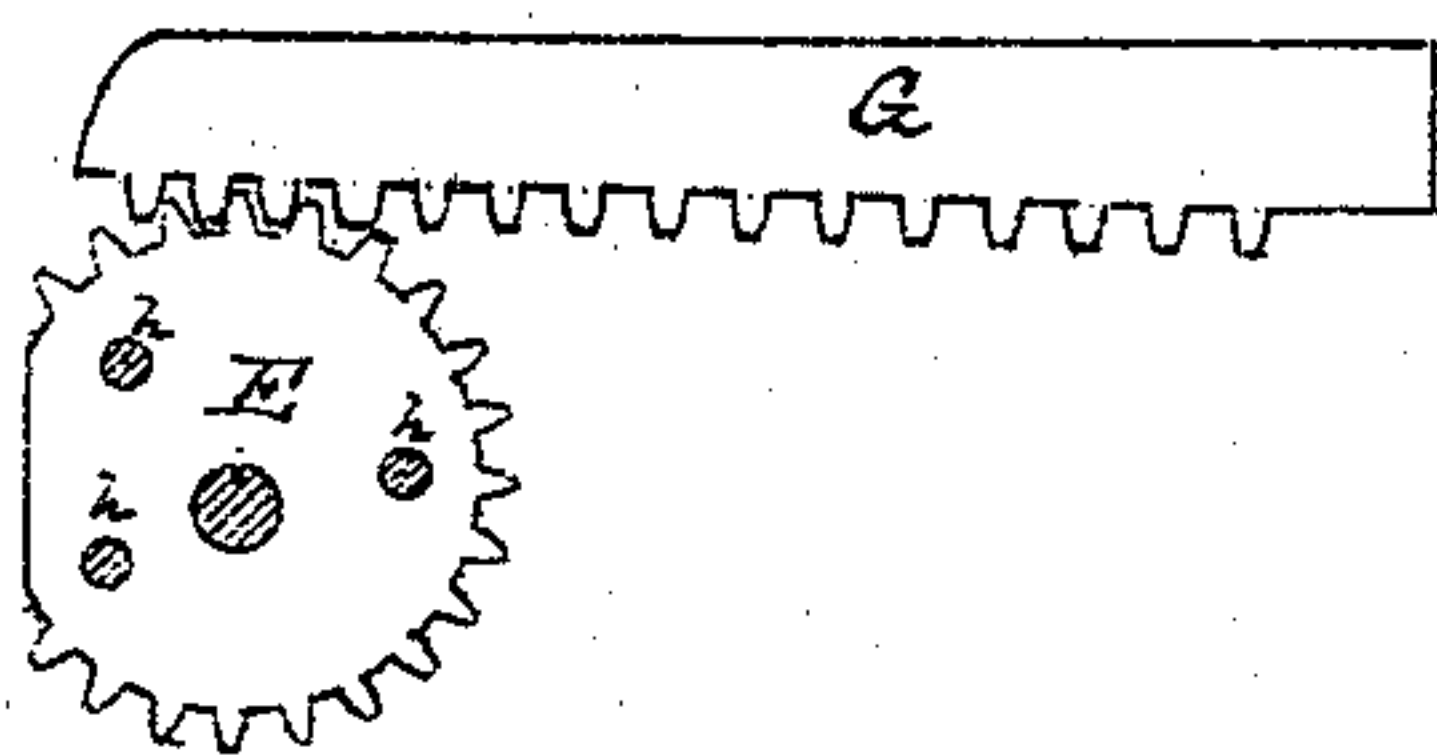


Fig. 3



Witnesses:

Julius W. L. C.  
J. W. L. C.

Fig. 4

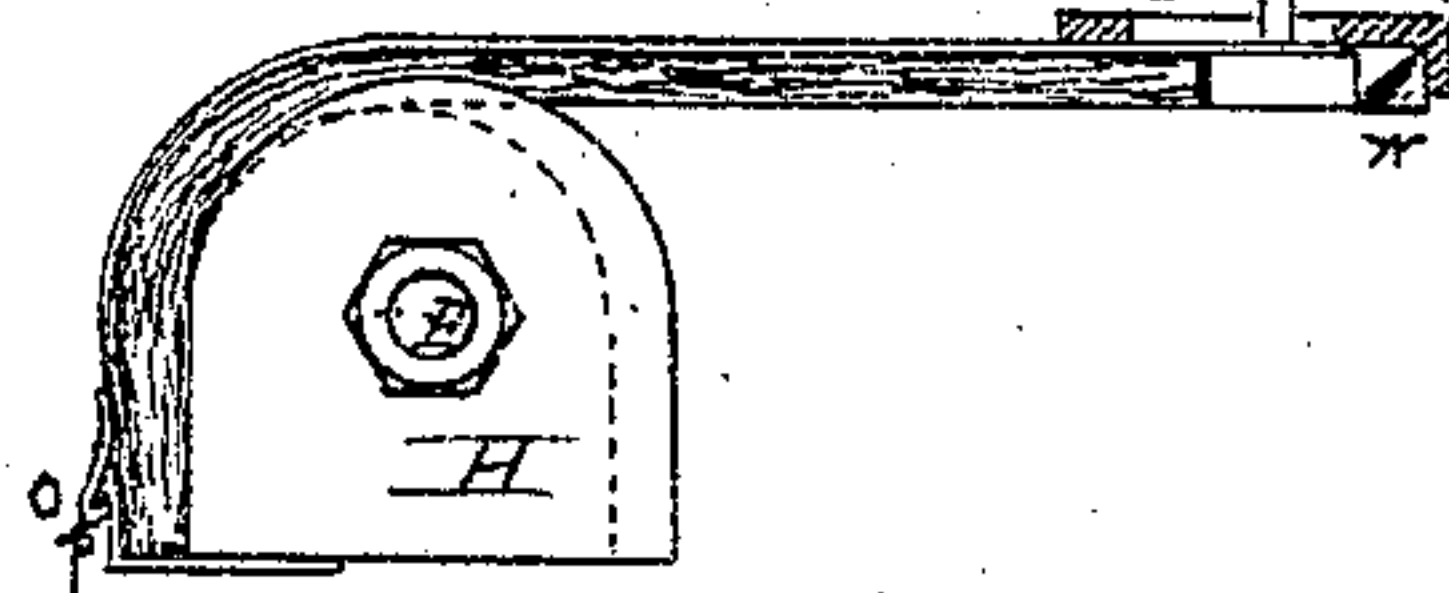
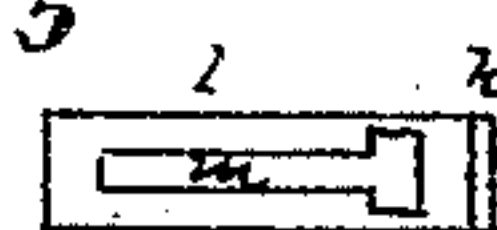


Fig. 5



Inventor:

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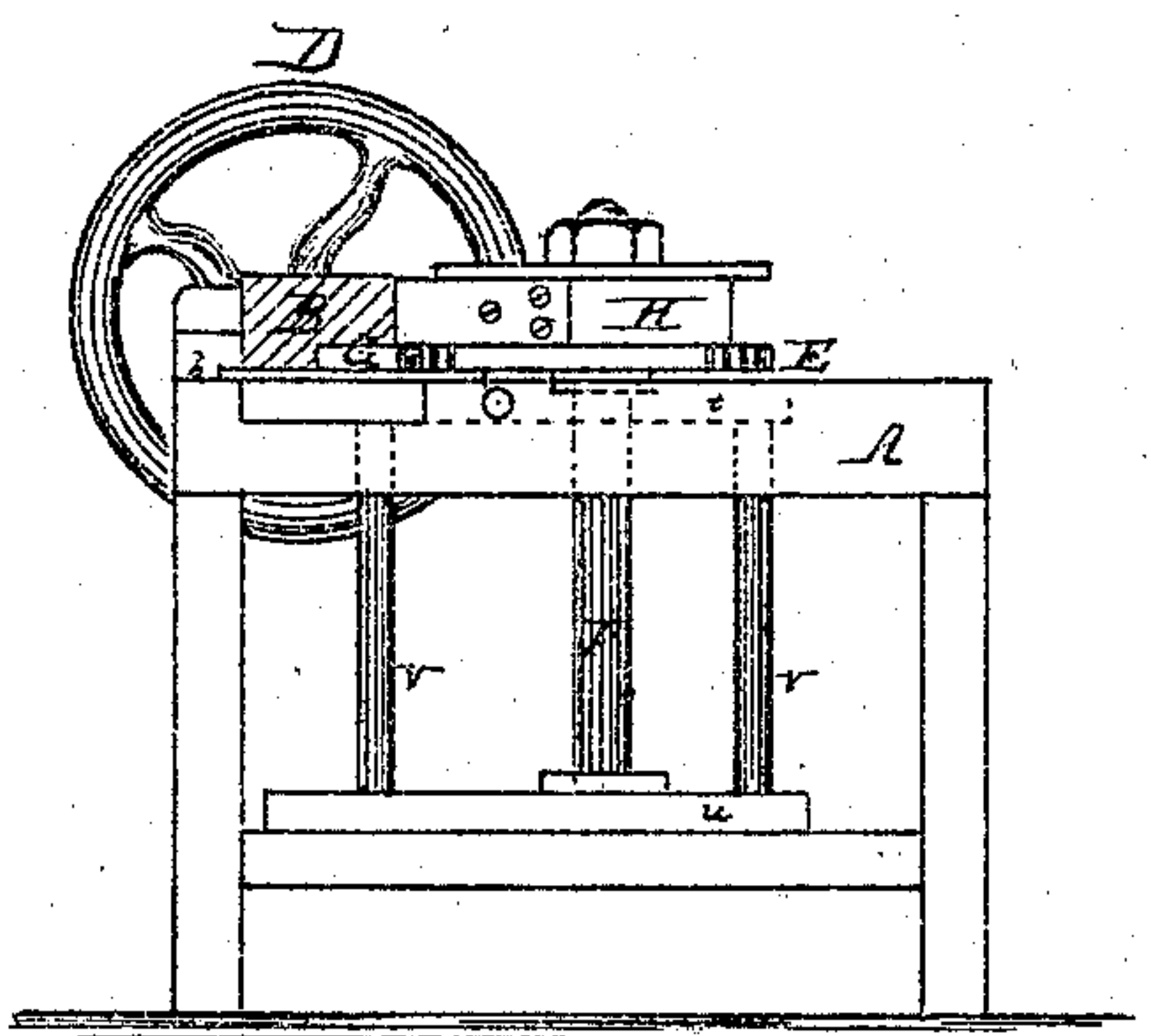


Fig. 6

Fig. 7

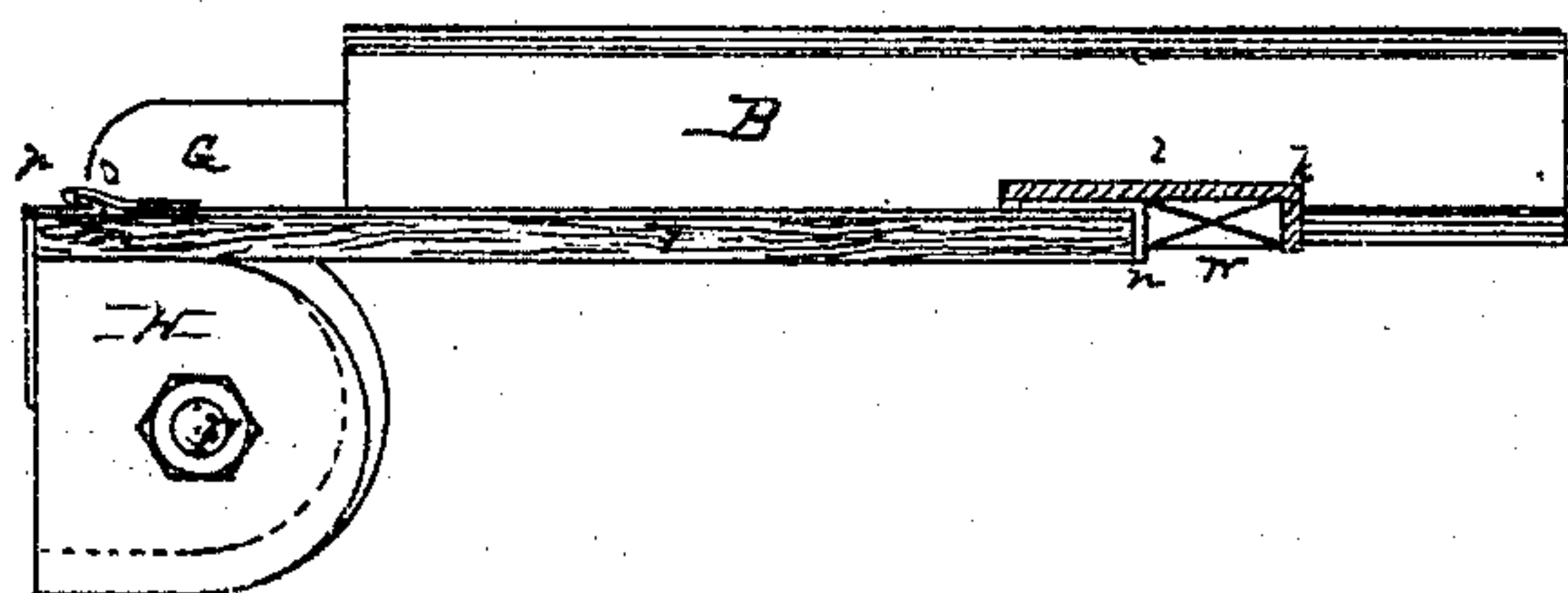


Fig. 8

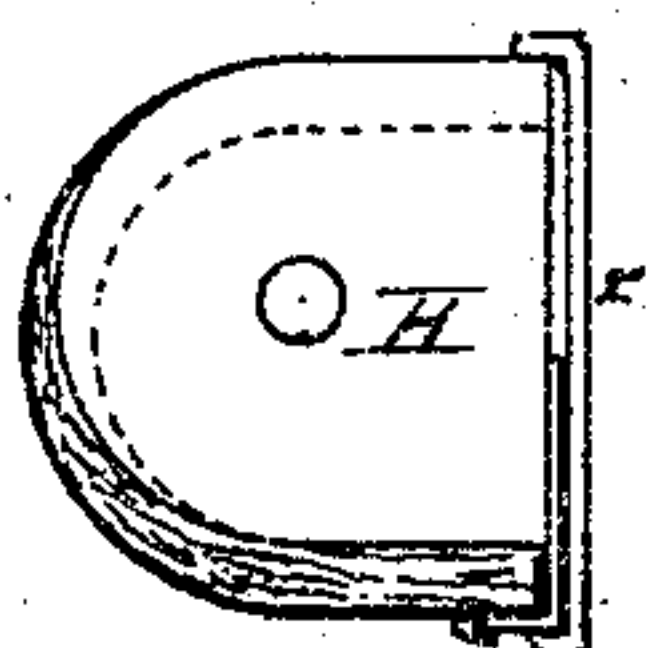
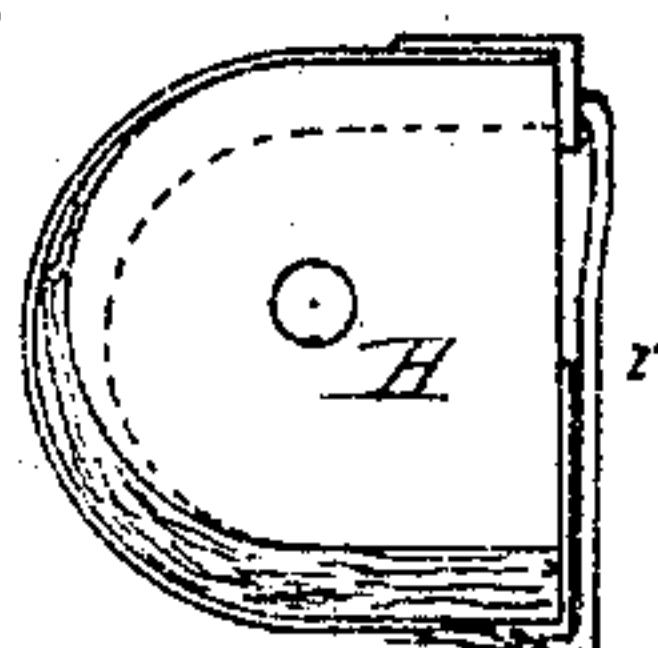


Fig. 9



Witnesses

Julius W. W. W.  
J. W. W.

Inventor:

Levi E. Minott



# UNITED STATES PATENT OFFICE.

LEVI E. MINOTT, OF SHEBOYGAN, WISCONSIN.

## IMPROVEMENT IN WOOD-BENDING MACHINES.

Specification forming part of Letters Patent No. 117,663, dated August 1, 1871.

*To all whom it may concern:* -

Be it known that I, LEVI E. MINOTT, of Sheboygan, in the county of Sheboygan and State of Wisconsin, have invented a new and useful Improvement in Wood-Bending Machines; and I do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon, and being a part of this specification, in which—

Figure 1 is a plan or top view of my invention, showing the wood in position for bending. Fig. 2 is a similar view, showing the wood bent. Fig. 3 is a plan view of the eccentrically-gearied pinion and rack. Fig. 4 is a plan view of the "form" and the wood partly bent, showing the operation of the eccentrically-gearied pinion in keeping the wood away from the form to avoid lateral compression. Fig. 5 is a view of the slot in the sliding frame for receiving and retaining the strap. Fig. 6 is an end elevation of Figs. 1 and 2. Fig. 7 is a plan view of the form, sliding frame, and wood, in a similar position to that shown in Fig. 1, exhibiting the manner of inserting the strap when said strap is to remain upon the wood after bending; and Figs. 8 and 9 are views of the form, showing the different ways of tying the wood by the tie-bars.

Like letters of reference made use of in the several figures indicate like parts.

This invention relates to a machine for bending wood; and it consists of a sliding frame or bed for securing and pressing forward the wood and a revolving eccentric form for retaining and shaping the same. The form is carried upon a pinion which is engaged with and revolved by a rack upon the sliding bed, which, in turn, may be operated by a screw. The form is pivoted eccentrically, so that the wood, after it has been partially bent, will stand away from the face of the form or the periphery thereof, so that it may not be subjected to a lateral compression, which would tend to produce an irregularity in the bent wood, one part being liable to be made thinner than another. The eccentrically-pivoted form avoids this difficulty.

To enable those skilled in the art to make and use my invention, I will proceed to describe the same with particularity, making use, in so doing, of the aforesaid drawing.

A is a strong frame-work or table for support-

ing the mechanism. B is a sliding frame, fitted to move in the grooved ways  $b b^1$  and hollowed to receive the screw C, which is provided with bearings at  $c$  in the table, and engages a fixed nut within the frame B. When this screw is revolved by means of the crank or wheel D the frame B is moved forward or backward with force. E is a horizontal pinion borne by the vertical stationary shaft F, being pivoted thereon a little to one side its center. This pinion meshes into a rack-bar, G, carried by the sliding frame B. To accord with the eccentric shape of the pinion this rack-bar is made with the teeth or cogs set at a slight angle to the line of motion in the bar, as will be clearly understood by reference to Fig. 3 of the drawing. The form H, made of proper shape, is secured to this pinion by means of dowels  $h h h$  and a central nut upon the projecting end of the vertical shaft. A gradually-diminishing flange,  $i$ , projects over the periphery of this form at the starting side to keep the wood from bending up or lifting under the pressure. A slight offset is made in the side of the sliding frame B, and fitted, at its termination, with the abutment  $k$ , which is of metal, and, in the present instance, is continued at right angles for a short distance in the form of a plate,  $l$ , furnished with a key-hole slot,  $m$ . A chain or strap is employed to hold the wood in place; and, to prevent checking and crimping, this strap may be left upon the bent stick, or it may be taken off and one strap used for all the wood bent. In the latter case the end of the strap next the abutment is provided with a sliding catch, which engages with the key-hole slot and secures the strap to the machine. But in any case it is necessary that the bent stick or wood should have a support or strap of some kind to prevent warping in drying, and an auxiliary light strap is used inside the strap affixed to the machine. This auxiliary strap need only be strong enough to prevent the wood from splintering or warping, ordinary Russia sheet-iron being deemed sufficient. In case one strong strap is used and left upon the stick, it is made with a simple abutment,  $n$ , to catch over the end of the stick, and having a hook,  $o$ , at the other end to attach it to the form at the point  $p$ . Fig. 8 illustrates the manner of applying the tie-rod  $r$  to the stick where the light auxiliary strap is used, and Fig. 9 exhibits the same in case of the strong single strap.



The stick to be bent is placed in the machine in the position shown at Figs. 1 and 7, and a key or wedge, *w*, driven in behind it to tighten it in place. The screw is now set in motion, and the stick or wood is forced along by an end pressure from the sliding frame, and at the same time is bent to the proper shape by the revolving form. Owing to the form being carried upon the eccentrically-pivoted pinion, the wood, at that side of the form which has the lesser radius, stands, by reason of its springiness, slightly away from the form, as clearly seen at Fig. 4, and is therefore subject to no compression from the strap. Where different-sized forms are used it is necessary to employ pinions of different diameters, and, consequently, the vertical shaft F must be arranged so as to be adjustable toward or away from the rack-bar G. For this reason said shaft is affixed to a sliding frame-work, consisting of the top and bottom pieces *t u* and the vertical pieces *v v*, the whole arranged to slide in proper grooved ways at top and bottom in the table, an ordinary set-screw being applied at any desired point to secure the affair at the right place.

It will be readily understood that, virtually,

the same result will be produced by making the pinion to work upon a true center and the teeth of the rack to coincide with the line of motion, provided the form is applied to the pinion so as to be eccentric, in the manner described.

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

1. The combination of the sliding frame B and the eccentric revolving form H, both constructed and arranged substantially as described and shown, and operating to give shape to said wood without lateral compression, as explained and set forth.

2. The combination of the sliding frame B, screw C, rack-bar G, and eccentrically-pivoted pinion E, substantially as specified.

3. The vertical adjustable shaft F for supporting the pinion carried in the sliding frame, consisting of the top and bottom pieces *t u* and the vertical pieces *v v*, arranged in a wood-bending machine, as specified and shown.

LEVI E. MINOTT.

Witnesses:

J. W. MUNDAY,  
JULIUS WELCKE.