

No. 689,730.

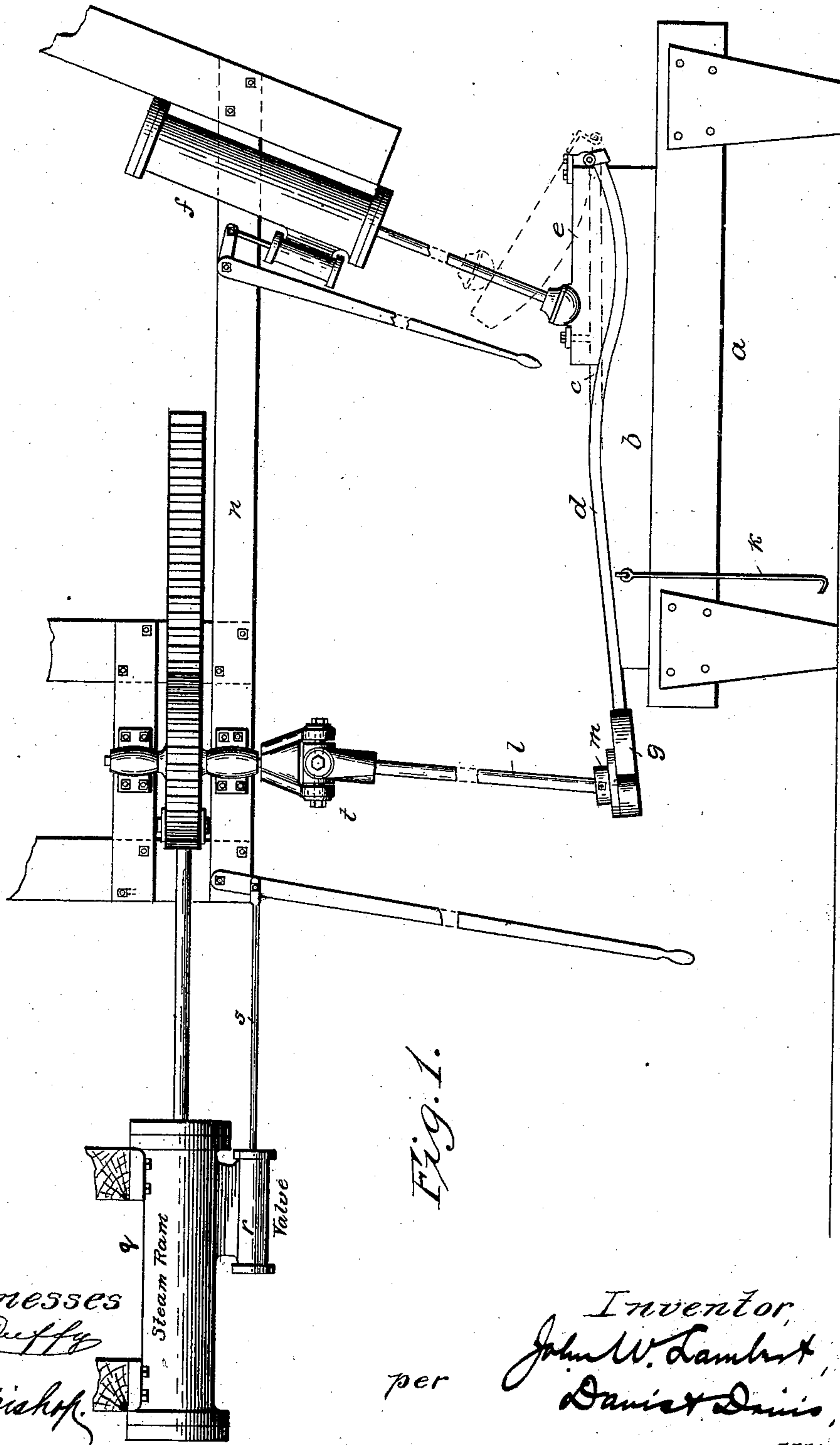
Patented Dec. 24, 1901.

J. W. LAMBERT.  
WOOD BENDING MACHINE.

(Application filed May 7, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses  
*Ed. Duffy*  
*R. H. Bishop*

per

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*John W. Lambert*,  
*Daniel Davis*,  
Atty's.

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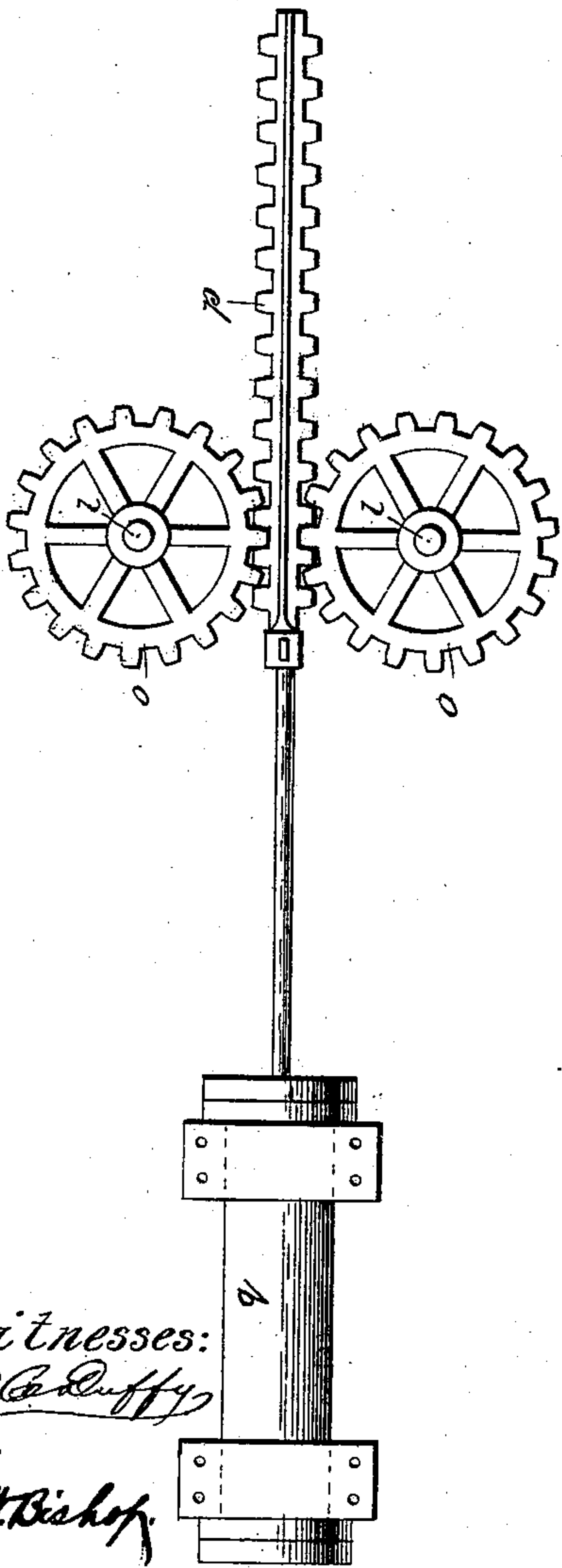
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2 Sheets—Sheet 2.

Fig. 2.



Witnesses:

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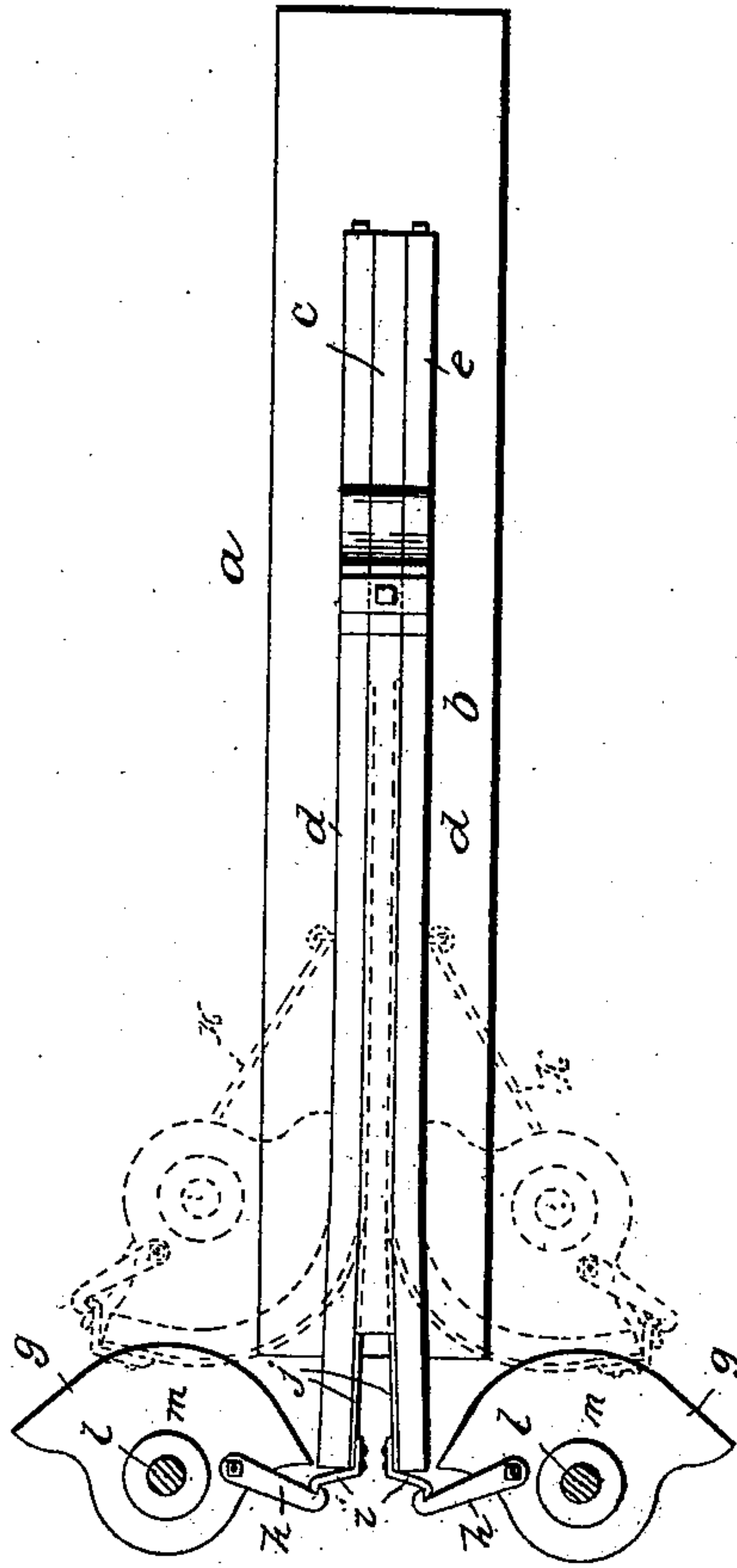


Fig. 3.

Inventor:

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# UNITED STATES PATENT OFFICE.

JOHN W. LAMBERT, OF ANDERSON, INDIANA, ASSIGNOR TO THE BUCKEYE MANUFACTURING COMPANY, OF ANDERSON, INDIANA.

## WOOD-BENDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 689,730, dated December 24, 1901.

Application filed May 7, 1901. Serial No. 59,154. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. LAMBERT, a citizen of the United States of America, residing at Anderson, county of Madison, State of Indiana, have invented certain new and useful Improvements in Wood-Bending Machines, of which the following is a full, clear, and exact description.

Figure 1 represents a side elevation of my apparatus; Fig. 2, a detail plan of the rack-and-pinion mechanism for operating the former-shafts, and Fig. 3 a detail plan of the formers and bed.

The object of this invention is to provide simple power mechanism for bending the heel ends of wooden vehicle thills or shafts, thereby avoiding the loss of time and labor consumed in bending the thills or shafts by manual power, as more fully hereinafter set forth.

Referring to the drawings by letters, *a* designates the bench upon which the bed or stationary form *b* is removably placed, this form or bed being provided with a longitudinal rib *c* on its upper side, against the opposite sides of which the respective thills or shafts *d* or other parts to be bent are clamped; *e*, the hinged former, adapted to shape the tip ends of the shafts or thills and operated by a steam-ram *f* in the usual manner; *g*, a pair of cam-formers horizontally arranged at the heel end of the bed and provided with hooks *h* at their respective inner corners adapted to detachably engage hooks *i*, attached to the respective free ends of the flat bending-springs *j*, the other ends of these springs being secured against the respective sides of the rib *c*, and *k* the holding-hooks, pivoted to a suitable part of the bed *b*. All the foregoing parts are constructed in the usual manner except that the cam-formers are usually provided with hand-levers to operate them, while in the present invention they are operated by a pair of depending rock-shafts *l*, connected at their lower ends to the respective cam-formers by a gimbal-joint *m* and journaled at their upper ends in suitable journal-boxes supported on a stationary frame *n*, each of these shafts carrying a gear-wheel *o*, which meshes with one side of a double rack-bar *p*. To reciprocate this rack, I employ any suitable

(preferably steam) power-cylinder *q*, the piston-rod of which is connected directly to the rack. The movement of the piston in the cylinder is controlled by a valve *r*, whose rod is connected to a hand-lever *s*, located so as to be within easy reach of the operator. Inserted in each of the shafts *l* at a point below the lowermost bearing is a universal-joint coupling *t* for a purpose hereinafter set forth.

In operation the tip ends of the thills are first bent down and clamped and the hooks on the respective cam-formers are engaged with the respective hooks on the bending-springs in the usual manner. Then steam or other motive fluid is let into the cylinder to draw in the rack and rock the depending shafts, which action partially rotates the cam-formers and carries them bodily backward to the position shown in Fig. 3, wrapping or bending the springs and heel portions of the shafts upon the curved faces of the respective formers, as shown in dotted lines in Fig. 3. Then hooks *k* are engaged with hooks *i*, hooks *h* being released. Then the bed portion carrying the bent shafts held by the hinged former *e* and springs *j* and hooks *k* may be removed entirely from the bench and laid aside to permit the shafts to dry and set. When the bed carrying the shafts is removed, the cam-formers are brought back to their original position by a reverse movement of the rack-bar, so that the apparatus will be ready for another operation as soon as another bed and pair of shafts are put into position on the bench.

It will be observed that the gimbal connections of the depending rock-shafts and the universal joints or couplings therein give the freedom of movement necessary to permit the lower ends of the shafts to freely swing laterally and backward as they are rotated, the paths of the lower ends of the shafts depending, of course, upon the particular curvature of the working faces of the cam-formers.

By my apparatus not only is the laborious and time-consuming operation of working the cam-formers by hand avoided, but also is much lateral area saved, by reason of the location of the operating mechanism overhead, where it will not interfere with the movements of the operators in the least.

It is obvious that such changes in the spe-



cific construction of the apparatus as will adapt it to bending bars for purposes other than vehicle-thills may be made without departing from the invention in the least; also, 5 that the machine may be adapted to operate upon but one thill instead of two, if desired.

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

10 1. In an apparatus for bending bars, the combination of a bed, means for clamping the bar to be bent thereon, a horizontally-arranged former and means for connecting it to the bar to be bent, a depending shaft connected to 15 said former, and overhead devices for rotating said shaft.

2. In combination, a bed and means for clamping a bendable bar thereon, a laterally-movable former and means for connecting it 20 to said bar, a depending shaft connected to said former and laterally movable with it, and overhead devices for rotating this shaft.

3. In an apparatus of the class described, 25 the combination of a bed, means for clamping a bendable bar thereto, a rotatable bodily-

movable former and means for connecting it to the bar, a shaft connected by a gimbal-joint to said former and having a universal joint in it, so that said shaft will be bodily 30 movable with said former at the point of connection therewith, means for supporting said shaft, and means for rotating it.

4. In an apparatus for bending bars, the combination of a bed and means for clamping 35 a bendable bar thereto, a rotatable bodily-movable former and means for connecting it to said bar, a depending rotatable shaft and means for suspending it from a point overhead, said shaft being provided with a uni- 40 versal joint and being connected to said former by a gimbal-joint, and power mechanism for operating said shaft.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 29th day of April, 1901.

JOHN W. LAMBERT.

Witnesses:

ALICE L. MARSHALL,  
E. W. LONGANAKER.