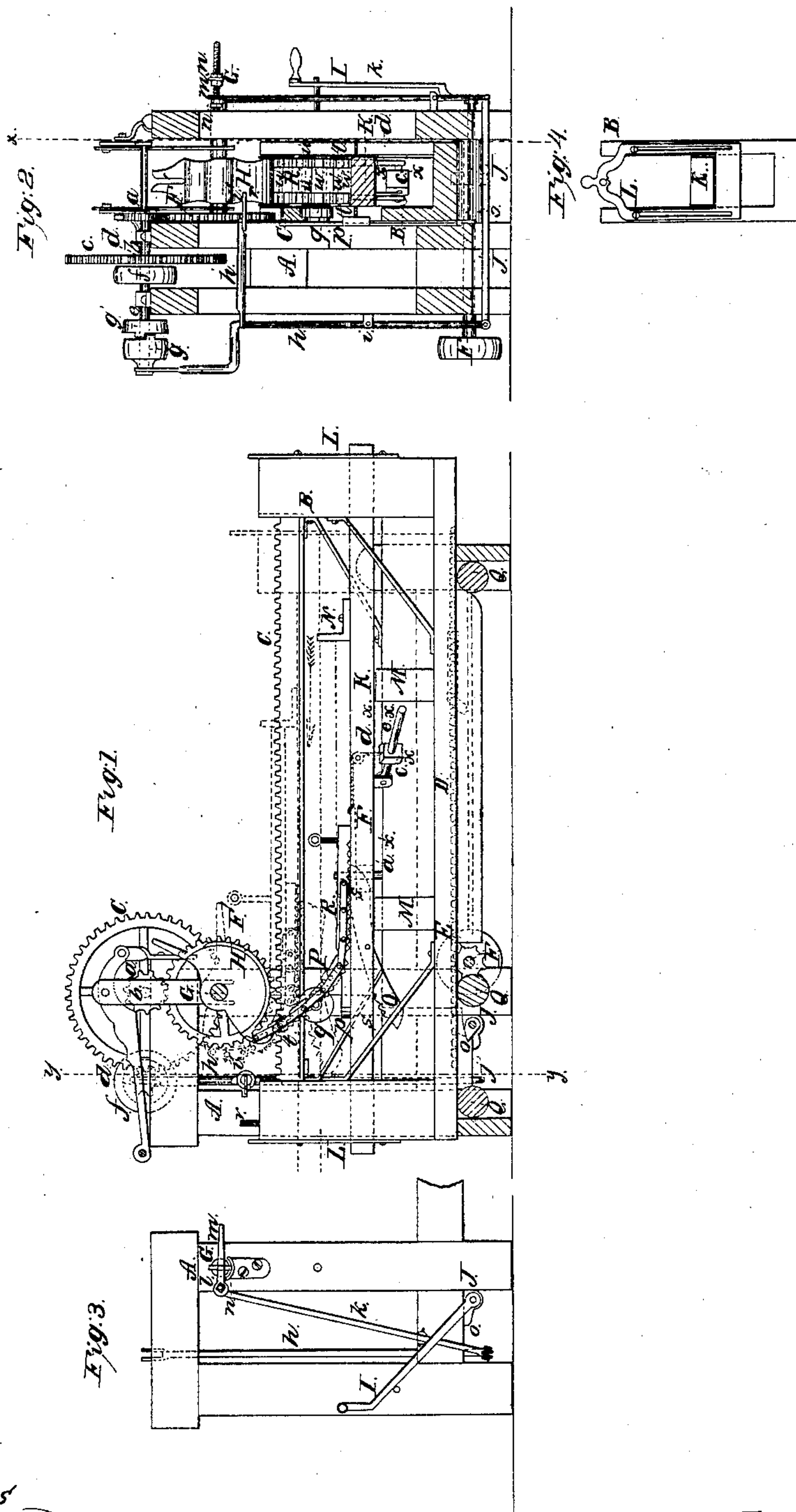


J. G. Ernst,
Bending Wood.

No 24,971,

Patented Aug. 2, 1859.



Witnesses
John A. Wilson.
John Work.

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UNITED STATES PATENT OFFICE.

JOHN G. ERNST, OF YORK, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND S. R. SLAYMAKER,
OF SAME PLACE.

MACHINE FOR BENDING PLOW-HANDLES.

Specification of Letters Patent No. 24,971, dated August 2, 1859.

To all whom it may concern:

Be it known that I, JOHN G. ERNST, of York, in the county of York and State of Pennsylvania, have invented a new and Improved Machine for Bending Plow-Handles and other Articles or Work in Proper Curved Form; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, is a longitudinal vertical section of my invention taken in the line *x, x*, Fig. 2. Fig. 2, is a transverse vertical section of ditto taken in the line *y, y*, Fig. 1. Fig. 3, is a section of ditto showing one feature of the invention. Fig. 4, is a detached view of one of the slides to which the bed is attached.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in a peculiar mechanism as hereinafter fully shown and described, whereby the timber as it is bent is “upset” and so acted upon that its strength will not be injured or impaired by the process of bending.

The invention is designed to be self-acting or automatic in its operation, so that the timber will be subjected to the proper action without any care or attention on the part of the operator except the placing of the timber in the machine and the removal of the finished work therefrom.

To enable those skilled in the art to fully understand and construct my invention I will proceed to describe it—

A, represents a framing which may be constructed in any proper manner to support the working parts, and B, represents a carriage which is fitted in said framing and allowed to move freely back and forth therein. This carriage B, has a rack C, secured to its upper part and a rack D, is attached to its bottom. Into the lower rack D, a pinion E, gears, said pinion E, being on a shaft F, which is placed transversely in the lower part of the framing A. The upper rack C, has its end fitted loosely in grooves in the carriage so that it may be thrown in and out of gear with a wheel F', in the framing, said wheel F', gearing into a pinion *a*, which is placed on a shaft *b*, on the upper part of the framing A, said shaft having a toothed wheel *c*, placed on it, into which

wheel a pinion *d*, on a shaft *e*, gears. On the shaft *e*, a pulley *f*, is placed, and also a clutch *g*, the latter being attached to a lever *h*, the fulcrum pin of which is shown at *i*, Fig. 2. The lower end of lever *h*, is attached to a bar *j*, below the framing A, and to this bar *j*, an upright lever *k*, is attached, the lever *k*, being at the opposite side of the framing A, from the lever *h*, as shown clearly in Fig. 2. Through the upper end of lever *k*, a screw *l* passes, said screw also passing through a shaft G, which serves as the axis of the form block H, the use of which will be presently explained.

The rack C, in the carriage B, is raised and lowered by means of a lever I, which is attached to a shaft J, at the under part of the framing, said shaft J, having a cam *o*, on its inner end which cam actuates a vertical bar *p*, having a friction roller *q*, at its upper end and on which roller the rack C, rests or bears, see Figs. 1 and 2.

To the back end of the carriage B, a vertical pin *r*, is attached and in the carriage B, a bed K, is placed, the ends of which rest in slides L, L, which are adjusted, one to each end of the carriage B, and admit of the bed K, being raised and lowered. In the carriage B, vertical supports M, are placed to receive the bed when it is depressed or at its lowest point. On the bed K, a short upright plate or stop N, is firmly secured and in the bed K, two curved toothed plates O, O, are placed, one near each side of the bed. These plates are toothed on their upper convex surfaces at each end as shown at *s*, Fig. 1.

In the framing A, directly below the bed K, a roller P, is placed, shown in red in Fig. 1, and the carriage B, works on rollers Q.

The block H, which is placed on the shaft G, is of semi-cylindrical form and a chain R, is attached to its periphery. This chain is formed of two series of parallel links *t, t*, having blocks *u*, fitted between them, the under surfaces of the blocks being notched to receive the teeth of the segment plates O, O, see *u'*, Fig. 2. To the lever *h*, a horizontal rod *h'*, is attached, said rod *h'*, having a lever *i'*, attached to it, see Fig. 2.

The operation of the machine is as follows:—The carriage B, is drawn back to its fullest extent, or as far as necessary and the stick or “bolt” shown in red is properly steamed and placed on the bed K, one end of

the stick being against the stop N, and the opposite end fitting in the inner link or block of the chain R. Several sticks may be placed side by side the chain R, and block H, being sufficiently wide to receive them. The bed K, is elevated as shown in red, Fig. 1, the roller P, being below it, and the rack C, is elevated and thrown in gear with the wheel F'. Power is then communicated to the shaft F, from the shaft e, and the carriage B, is moved along in the direction indicated by the arrow 1. This movement of the carriage B, forces the sticks between the block H, and the chain R, the latter being stretched at the proper time during the turning of the block H, by means of the toothed segment plates O, O, gearing into the notches u', of chain R, which plates are actuated by the roller P, as the carriage moves. This stretching of the chain R, keeps the sticks firmly to the block H, and causes the inner sides of the sticks to be "upset" the toothed plates O, having their teeth s, made of such size or pitch relatively with the notches in the chain R, as to stretch and relax, the chain at the proper points, so as to insure the proper bending of the wood around the block H, without breaking or injuring its fiber. When the carriage B, has reached the extent of its forward movement the lever I, is actuated and the rack C, depressed and thrown out of gear with wheel F', and the shaft G, is withdrawn from the block H, and the latter with the bent sticks removed. In withdrawing the shaft G, the lever k, is actuated and the clutch g, thrown in gear with a pulley g', on shaft e. By this operation the carriage B, is gigged back

by the pinion o, and when it reaches the termination of its backward movement the pin r, strikes the lever or button i', and throws the clutch g, out of gear with g'. Another block and chain is then inserted in the frame A, another set of sticks applied and the operation repeated.

Blocks H, of different forms and dimensions may be used according to the work required.

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

1. The employment or use of the form block H, fitted in the frame A, with chain R attached with or without the weight, c^x in connection with the roller P, and the toothed segments O, O, and stop N, the latter being attached to the bed K, in carriage B, the whole being arranged to be operated as and for the purpose set forth.

2. The arrangement of the lever h, connected with clutch g, the connecting bar j, and the lever k, attached to shaft G, in connection with the rod h', and lever or button i', substantially as shown, whereby the operation of the machine, so far as the gigging back motion is concerned, is rendered automatic throughout.

3. The movable rack C, when adjusted and arranged substantially as shown with the wheel F', for the purpose of stopping the feed or forward movement of the carriage B.

JOHN G. ERNST.

Witnesses:

JOHN A. WILSON,
JOHN KOCHS.