(No Model.)

J. McDOWELL.

BENDING MACHINE.

No. 253,934. Patented Feb. 21, 1882.

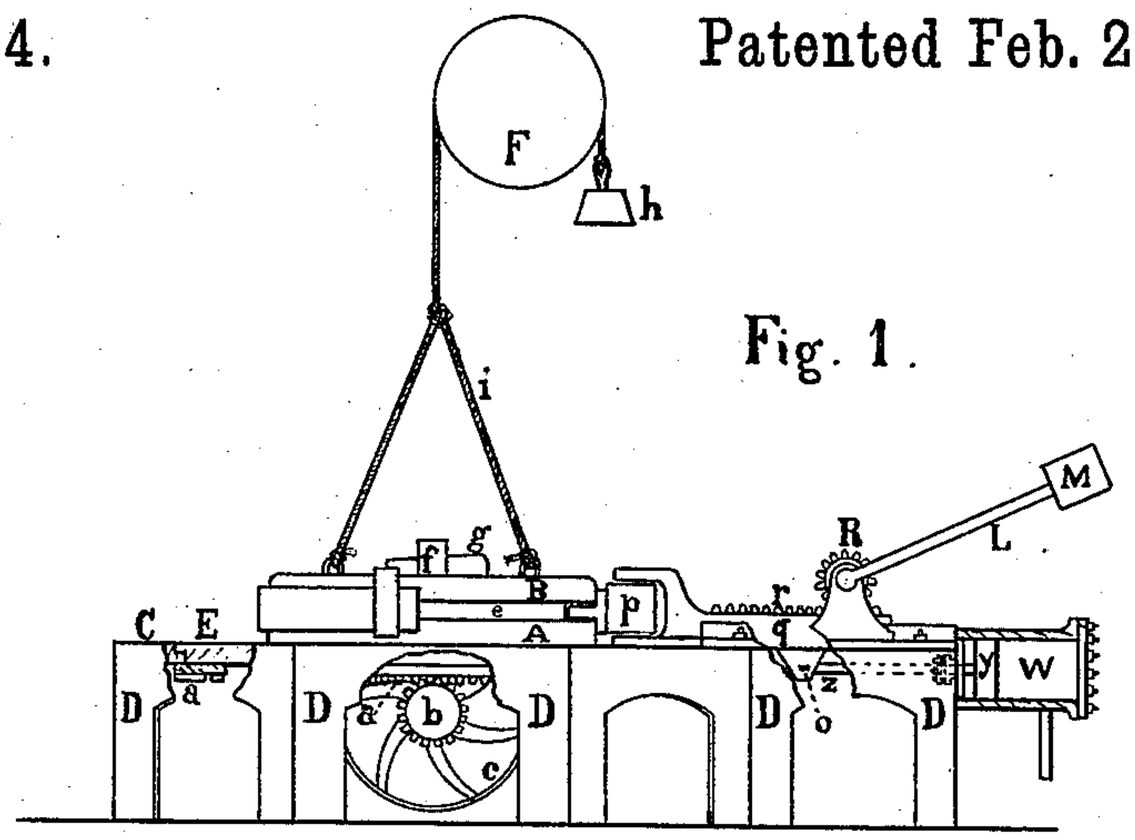


Fig. 1.

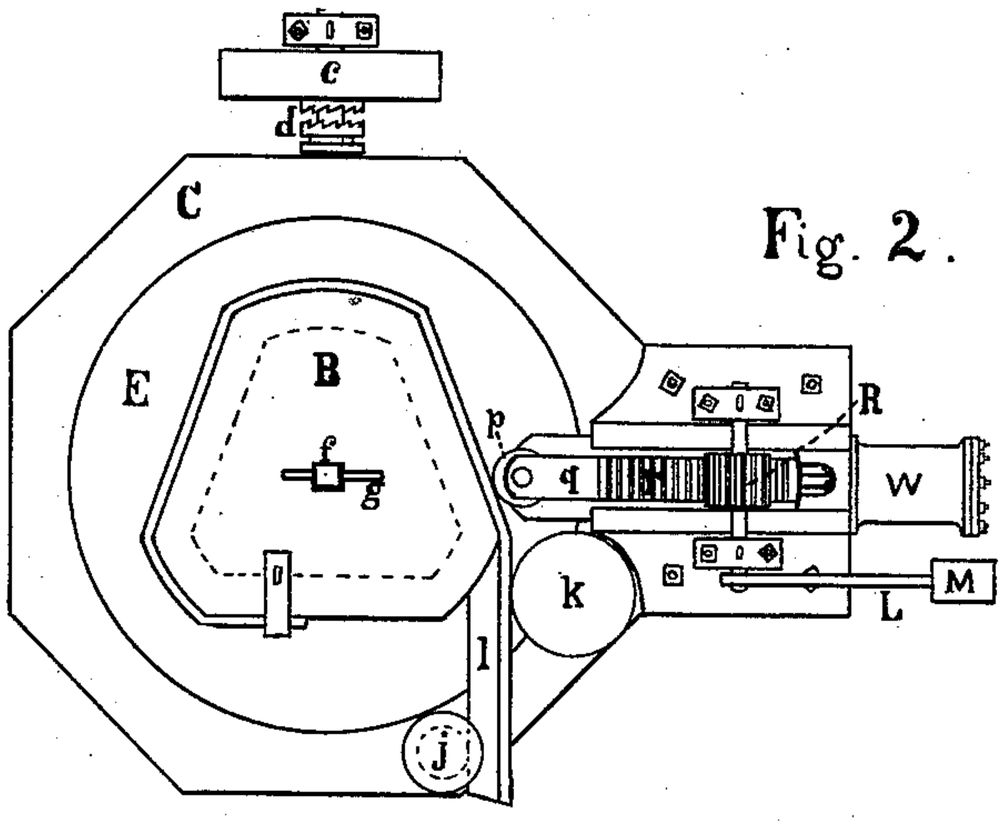
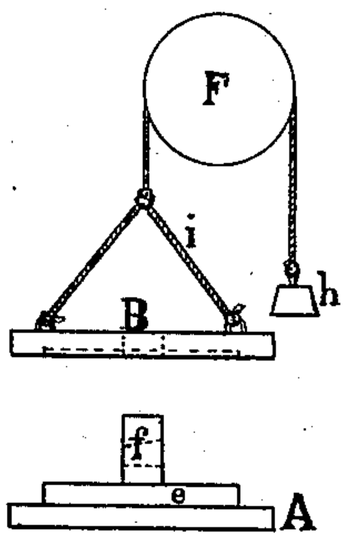


Fig. 2.

Fig. 3.



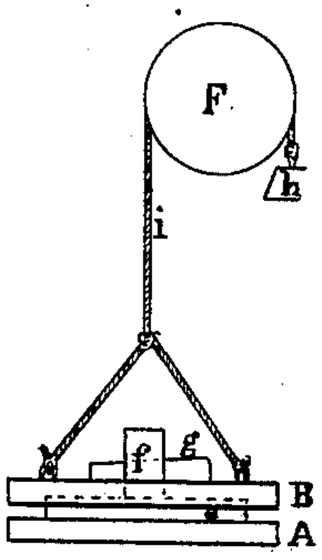


Fig. 4.

Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN McDOWELL, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE UNION FOUNDRY AND PULLMAN CAR WHEEL WORKS, OF SAME PLACE.

BENDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 253,934, dated February 21, 1882.

Application filed November 4, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN McDOWELL, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Bending-Machines, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to improvements in bending-machines in which bar-iron shapes of irregular curves are bent; and the object of my invention is to form such bar-iron shapes in a cheaper manner than heretofore and of exact duplication one with another.

My invention consists, first, in a machine for bending bars to irregular form, the combination of an anti-friction roller, which, by a yielding pressure against the bar, shall shape it to the form of the pattern, with a rotating pattern-die of irregular form, and with the specified construction of parts connected therewith, substantially as hereinafter shown and claimed; and, second, in bending-dies of the construction herein shown for bending such irregular curved form shapes, all substantially as hereinafter shown.

Referring to the drawings, like letters refer to like parts, in which—

Figure 1 is an elevation of the machine, partly in section, and with portions of the frame broken away. Fig. 2 is a top view of the machine. Figs. 3 and 4 are detail views of the dies A and B.

The table C and its legs D constitute the frame of the machine. In the table C is a circular opening, in which is loosely seated a revolving bed, E, to which the dies A B are attached, as will be understood by the drawings.

a is a crown-wheel of bevel-gear bolted to the under side of the bed E, and *b* is a pinion driving the crown-wheel, causing the bed E to rotate. *c* is a belt-pulley by which power is applied. *d* is a clutch used to stop and start the revolving bed. The pulley *c*, clutch *d*, and the pinion *b* are all attached to the same shaft, as shown.

A B are the bending-dies, made in parts, consisting of the parts A and B, of like size and shape, with a part, *e*, of smaller size interposed between them, whereby a recess or groove is formed, the part *e* forming the bottom of the recess or groove, as will be understood by inspecting the drawings. The part A and part *e* are made solid, preferably cast in one piece, with the post *f* extending through a perforation in the part B, and a key, *g*, put through the post above the part B, securing the parts A B rigidly together, as shown in the drawings. The dies A B are of an irregular outline form, having straight sections and segment-curved sections, as shown in the drawings.

F is a fixed pulley suspended above the machine. *h* is a dead-weight or counter-balance, connected by the rope or chain to the die B, by which the die B is lifted above the die A on removing the key *g*, as shown in Fig. 3. *j* and *k* are guide-rollers between which the bar to be bent passes, as shown in Fig. 2, and *l* is the bar of iron being bent around the dies.

p is an oscillating roller mounted on the end of the sliding bed *q*, having a rack, *r*, into which the pinion R is geared. The pinion R is seated on a shaft, which carries the lever L, on which there is a weight, M, as shown in the drawings.

W is a steam-cylinder, with a piston *y* and a piston-rod, *z*. The cylinder is attached to the end of the frame C, and the piston-rod is connected at *o* with the sliding bed, as shown in Fig. 1.

In operation the dies A and B are caused to rotate, and the bar *l*, properly heated, is placed between the guide-rollers *j* and *k* and one end of the bar securely held to the dies by a clamp, and as the dies rotate the bar will be drawn in around the dies. The oscillating roller *p* has a power-forced bearing on the outside of the bar *l*, which drives the bar into all the irregular curves of the pattern-die, the weight M or steam applied in the cylinder acting with force to drive the roller *p* into all the irregular curves in bending.

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

1. In a machine for bending bars to irregular form, a table having an opening in its top, a revolving bed loosely seated in said opening, with pattern-dies of irregular form attached to said bed and rotating therewith, substan-

tially as shown, in combination with an anti-friction roller which, by a yielding pressure against the bar, shall shape it to the form of the pattern, substantially as and for the purpose set forth.

2. In a bending-machine, the dies A B, constructed in parts, the part A constructed with an offset or smaller sectional part, *e*, whereby a recess or groove is formed, the sectional part *e* forming the bottom of the recess or groove, as shown, and with post *f* and key *g*, substantially as and for the purpose set forth.

JOHN McDOWELL.

Witnesses:
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