E. L. Gaylord,

Flanging Machine,

No. 18,011. Patented Aug. 18, 1857.

Fig. 3

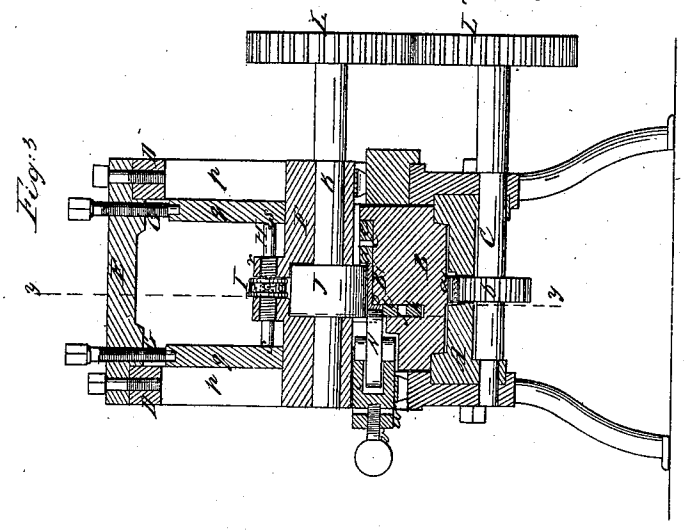

Fig. 4

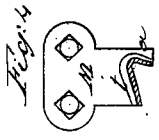

Fig. 1

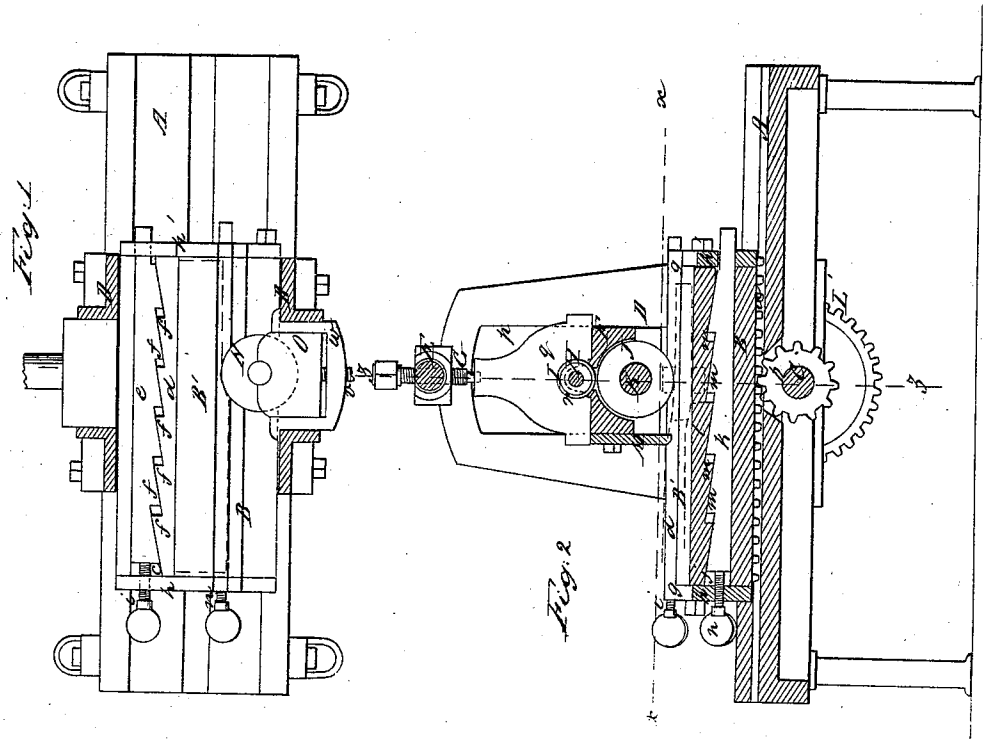

Fig. 2

UNITED STATES PATENT OFFICE.

E. L. GAYLORD, OF TERRYSVILLE, CONNECTICUT.

MACHINE FOR BENDING METAL PLATES.

Specification of Letters Patent No. 18,011, dated August 18, 1857.

To all whom it may concern:

Be it known that I, E. L. GAYLORD, of Terrysville, in the county of Litchfield and State of Connecticut, have invented a new and Improved Machine for Bending Metal Plates in Sharp Angular 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 horizontal section of my improvement, taken in the line (*x*) (*x*) Fig. 2. Fig. 2 is a longitudinal section of ditto, taken in the line (*y*) (*y*) Fig. 3. Fig. 3 is a transverse vertical section of ditto, taken in the line (*z*) (*z*) Fig. 2. Fig. 4 is a detached view of the bending or forming die.

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

This invention has for its object the bending of metal plates in sharp angular form, at one operation, so that the external as well as the internal angle formed by the bend will be perfectly sharp, and the plates thus bent be made to serve for lock cases and similar purposes, thereby dispensing with the heavy and expensive castings which are now employed.

The invention consists in the employment or use of a reciprocating bed, forming or bending die and pressure rollers, arranged and combined to operate conjointly as will be presently shown and described.

To enable those skilled in the art to make and use my invention I will proceed to describe its construction and operation.

A represents a cast-iron bed-piece of rectangular form, and having a longitudinal recess made in its upper surface, said recess extending the whole length of the bed-piece and having a carriage B fitted within it. This carriage has a rack (*a*) on its under surface and a pinion (*b*) gears into said rack, the pinion being placed on a shaft C, which passes transversely underneath the bed piece A, said shaft C being the driving shaft.

The carriage B is a solid block of metal having a longitudinal recess (*c*) made in its upper surface in which the bars (*d*) (*e*) are placed, said bars having inclined planes or wedged-shaped projections (*f*) formed on their inner or adjoining sides or edges as shown clearly in Fig. 1. One bar (*d*) has its ends fitted in dove-tail grooves (*g*) made in the upper parts of end plates (*h*) (*h'*) which are attached to the carriage B, see Fig. 2. The other bar (*e*) has a set screw, (*i*) bearing against it at one end, and the opposite end passes through a notch or recess in the end plate (*h'*) see Fig. 1.

A groove or recess, (*j*), is made in the carriage B, and two bars (*k*) (*l*) are placed edgewise in this groove. The bars (*k*) (*l*) are constructed precisely similar to the bars (*d*) (*e*), both being provided with wedge-shaped projections (*m*) as shown in Fig. 2. The lower bar (*k*) has a set screw (*n*) bearing against one end, while the opposite end passes through an opening in the plate (*h'*). The upper plate (*l*) is merely fitted loosely in the carriage.

The upper portion of the carriage B, between the outer edge of the bar (*d*) and the upper surface of the bar (*l*), forms a bed B' on which the metal strips to be bent are placed. This bed it will be seen by referring to Fig. 3, has a corner or angle (*o*) formed on it, as it has both an upper and side surface which are at right-angles to each other.

To the bed-piece A two upright plates D, D, are attached. These plates are connected at their upper ends by a cross-piece E. A rectangular metal block F has its ends fitted in openings (*p*) in the plates D, D. On the upper surface of the block F, and near each end, an upright bar (*q*) is placed, and the lower ends of screws G, G, which pass through the cross-piece E fit in the upper ends of the bars (*q*) (*q*). See more particularly Fig. 3.

H is a rod which passes through a projection (*r*) on the upper surface of the block F. This rod has a screw-thread formed on it at its center and within the projection (*r*) and a nut I is placed on said screw portion. The ends of the rod H are grooved and fitted on projecting cleats (*s*,) at the inner sides of the bars (*q*) (*q*), see Fig. 3.

Within the block F a roller J is placed. This roller is placed on a shaft K which passes through the block, and a toothed wheel L is placed on one end of the shaft K, said wheel gearing into a wheel L' which is placed on the shaft C. The roller J is placed directly over the upper surface of the bed B', as shown clearly in Fig. 3.

M is a former, or bending die, which is attached to one side of the block F. This

former or die is made of a steel bar, and its lower end is curved, as shown plainly in Fig. 4, the part (*t*) of the die being directly over the upper horizontal surface of the bed B′, and the part (*n*) projecting down by the vertical side of the said bed.

N, is a roller which is placed in a box O, said box being fitted in one of the plates D, and rendered adjustable by a set screw (*v*), and frame (*w*), within which the box O is allowed to slide. The face of roller N is parallel with the vertical side of the bed B′, and the roller J overlaps the roller N as shown clearly in Fig. 3.

The operation is as follows: The strip of metal P to be bent, shown in red, is placed on the bed B′, and the plate, by turning the shaft C, is forced underneath the forming or bending die M which bends the plate and forms a rounded corner corresponding to the form of the die as shown in Fig. 4. The plate thus bent is then passed under the roller J and by the side or roller N, and these rollers "upset" the bent plate and form the rounded corner produced by the die M into a sharp angular one as shown in Fig. 3. It will be seen that in order to have the rollers perform their work efficiently it is necessary that both edges of the plate P have a bearing so that the metal can be compressed and spread out in one direction only, viz. toward the angle; and, in order to effect this in the bending of plates of various widths, the bars (*d*) (*l*) are rendered adjustable by means of the wedge shaped projections (*f*) (*m*) formed on them, and also on the sliding bars (*e*) (*k*) as shown.

The pressure of the rollers J, K, is graduated by adjusting the set screws (*v*) G, G. The roller J it will be seen has a positive motion communicated to it from the shaft C; the other roller N has merely an independent motion produced by friction. The roller J it will also be seen is allowed to be adjusted laterally by turning the nut I so that its inner edge may always be made to bear against the edge of bar (*d*) and cover the whole upper surface of the bed B′.

This invention has been practically tested and it performs its work in a perfect manner. The ordinary finer lock cases are constructed of brass castings. These castings are first filed and then polished and considerable labor is expended upon them in order to have them nicely polished. The castings are also unnecessarily heavy, and the unnecessary weight added to the expense attending the finishing make the brass locks very expensive. By my improvement thin brass plates may be rolled in bent and sharp angular form as described, and as these plates require but little after work the expense of the cases will be very materially reduced. I would remark that German silver and other metals, or composites of metals, may be similarly bent.

I am aware that rollers have been arranged in various ways for rolling metals, and I also am aware that dies of various kinds have been used for drawing and bending metal bars and plates, I therefore do not claim separately any of the parts herein shown and described; but—

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

The combination of the reciprocating bed B′, forming or bending die M, and rollers J, N, arranged so as to operate conjointly as shown for the purpose set forth.

E. L. GAYLORD.

Witnesses:
I. H. Adams,
James Terry.