(No Model.)

N. KOENIG.

MACHINE FOR FOLDING SHEET METAL.

No. 380,580. Patented Apr. 3, 1888.

Fig. 1.

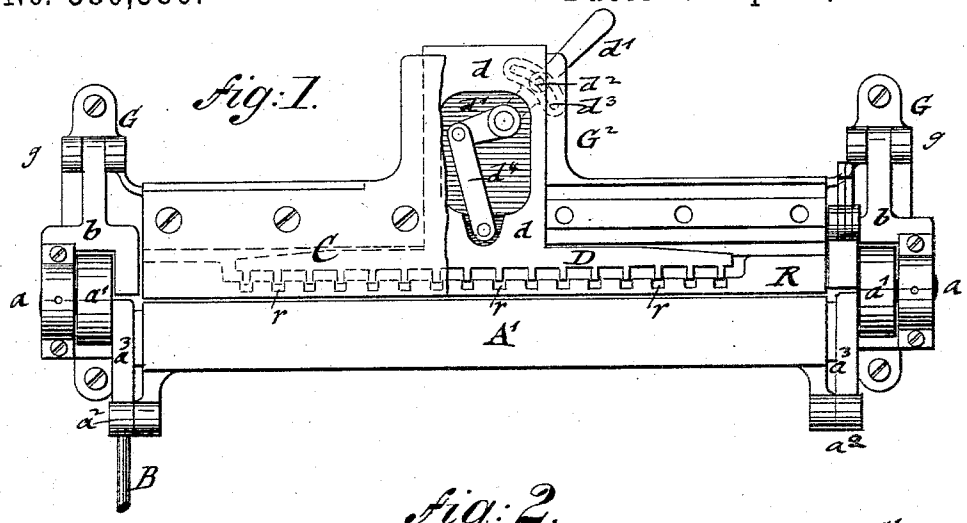


Fig. 2.

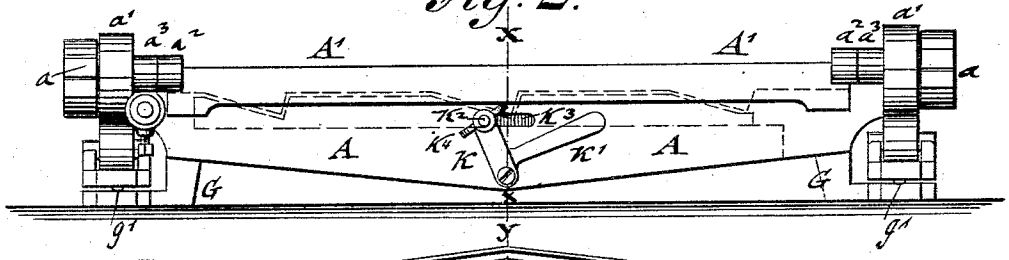


Fig. 3.

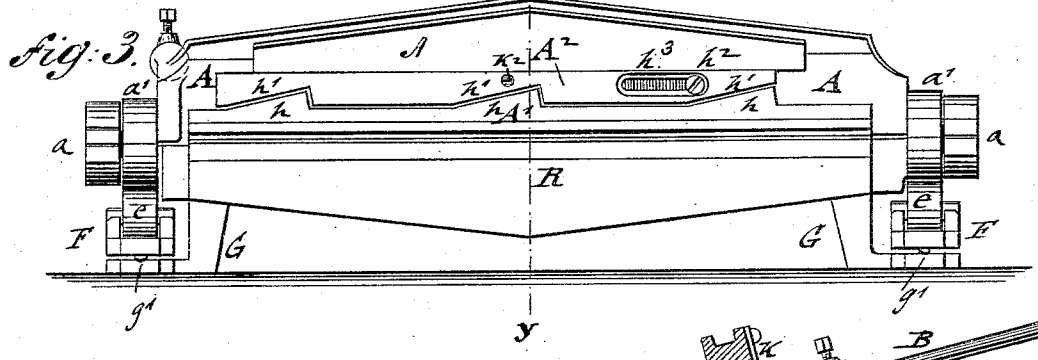


Fig. 4.

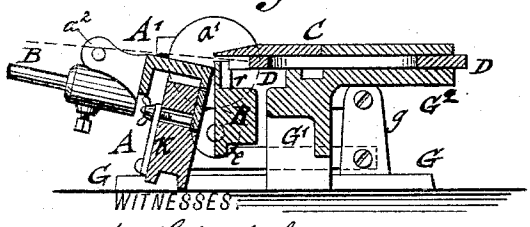


Fig. 5.

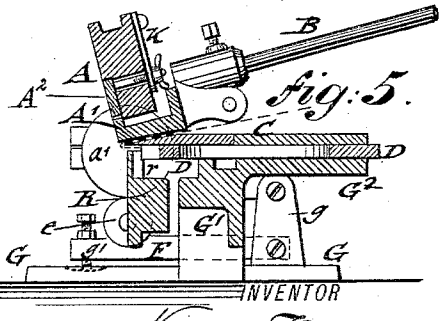
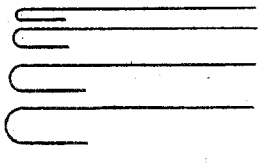


Fig. 6.



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UNITED STATES PATENT OFFICE.

NICOLAS KOENIG, OF NORTH TARRYTOWN, ASSIGNOR TO JACOB BROMBACHER'S SONS, OF NEW YORK, N. Y.

MACHINE FOR FOLDING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 380,580, dated April 3, 1888.

Application filed August 22, 1887. Serial No. 247,526. (No model.)

To all whom it may concern:

Be it known that I, NICOLAS KOENIG, of North Tarrytown, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Machines for Folding Sheet Metal, of which the following is a specification.

This invention relates to certain improvements in the machine for folding sheet metal for which Letters Patent were granted to me heretofore, under date of July 26, 1887, No. 367,214, the improvements being designed with a view to facilitate the adjustment of the bar for folding the sheet metal, and to increase the strength of the clamp by which the size of the folds are regulated.

The invention consists in the construction and combination of parts, which are to be hereinafter described, and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a plan or top view of my improved machine for folding sheet metal, a portion being broken away to exhibit some of the parts which constitute my improvements. Fig. 2 is a front view of the machine before folding the metal. Fig. 3 is a front elevation of the same after folding the same. Figs. 4 and 5 are vertical transverse sections of the machine, taken, respectively, on lines *x x* and *y y*, Figs. 2 and 3; and Fig. 6 shows different sizes of folds made by my machine.

Similar letters of reference indicate corresponding parts.

The general arrangement of the main parts of the machine is the same as that described in my prior patent referred to. They consist of a folding-bar, A, which is provided with journals *a a*, that are supported in bearings of a swinging frame, *b*. An arm, B, provided with a handle (not shown in the drawings) is applied to the swinging frame for operating the folding-bar A.

C is a stationary plate, around the edge of which the folding-bar A is moved. Beneath the plate C is a clamp, R, which forms a portion of the swinging frame *b*. A gage, D, is arranged below the plate C back of the clamp R and serves to regulate the width of that part of the sheet metal which is to be bent or folded over.

The journals *a* of the folding-bar A are provided with rollers *a'*, which may be made integral therewith. These rollers *a'* rest on antifriction rollers *e*, the journals of which are supported in bearings of the frame F. The frame F is pivotally connected at one end to standards *g*, which extend upwardly from the base-plate G of the machine, as shown clearly in Figs. 4 and 5. The frame *b* is also pivotally connected to the upper part of the standards *g*. The outer ends of the frame F are supported, by means of screws *g'*, on disks of spring-metal fitted into cavities of the base-plate G, which disks are clearly shown in my prior patent referred to, and indicated in dotted lines in Fig. 5.

When the edge of the sheet metal to be folded has been inserted below the edge of the folding-plate C and between the same and the upper edge of the clamp R as far as the gage D will permit, the folding-bar A is swung by means of a handle, B, from its horizontal position in front of the clamp R, as shown in Fig. 4, into the upward position shown in Fig. 5, whereby the sheet metal is bent or folded by the joint action of the plate, gage, clamp, and folding-bar, as shown in dotted lines in Figs. 4 and 5, respectively. Simultaneously with moving the folding-bar A into its upward position the journals *a* of the same move by their antifriction rollers *a'* over the rollers *e e*, so that the frame *b* is also raised to some extent. The clamp R is thereby moved upwardly, so as to clamp the edge of the sheet metal placed below the folding-plate C, which is accomplished by the action of the spring-disks on which it rests, which disks give the clamp R a yielding support, so that it can always yield to a slight extent. It is advantageous to provide for this yielding of the clamp R, in order that the machine may adapt itself to different thicknesses of the metal that is to be bent or folded. This adjustment may be accomplished by the screws *g'*; but owing to the yielding of the clamp the screws are not required to be adjusted for small differences in the thickness of the metal, but only when greater differences in the same occur.

The base-plate G is provided with an upward extension, G', which serves to support the folding-plate C. The upward extension, G', is pro-

vided at about the middle of its length with a horizontal extension, G^2. The gage D is provided with a shank, d, that is guided in the horizontal extension G^2. The gage D is adjustable forward and backward below the plate C in the direction of the axis of its shank d by means of a handle, d', that is fulcrumed to the extension G^2 and guided by a pin, d^2, in an arc-shaped slot, d^3, of the extension G^2, as shown in Fig. 1. The inner end of the lever-handle d' is located in a recess of the shank d, being applied to the inner end of the fulcrum of the same, and connected by a pivot-link, d^4, attached to the inner end of the lever d', to the shank d of the gage D, so that the latter can be readily adjusted forward or backward by oscillating the outer end of the lever d'. This feature is fully described and claimed in my prior patent. In this patent the clamp R is provided with recesses r for the gage-fingers, that extend entirely across the upper edge of the same, so as to reduce to some extent the strength of the clamp and cause it to bend slightly near the center by the pressure exerted in bending the metal. To obviate this effect and produce a uniform clamping action on the sheet metal to be folded, the recesses r for the gage-fingers are so arranged that they extend only partly through the upper part of the clamp R sufficiently to guide the same. This produces a continuous unbroken edge at the upper front part of the clamp R, which increases materially the effective clamping action of the same. The continuous edge of the upper front part of the clamp R has the further advantage that a uniform grip on the metal is exerted all along the edge of the same, and that consequently narrower strips can be folded over the edge without denting, which is the objectionable feature of my prior patent. This forms the first point of my improvement.

The second feature consists in the means for adjusting the folding-bar. In the folding-machines heretofore in use this was accomplished in an imperfect manner by a clamping-screw that passed through a slot of the movable section of the folding-bar and engaged the adjustable section of the same. The adjustable section of the folding-bar A was hinged and provided with inclined projections, while the movable section was arranged along said inclined recesses, so that the movable section, and thereby the edge of the folding-bar, could be set closer to or farther away from the edge of the plate C, and thereby the sheet metal folded in such a manner that the bent portion was closer to or farther from the body of the sheet.

To produce the accurate adjustment of the movable section A′ of the folding-bar A, the same is hinged at a^2 to arms a^3 of the rollers a' and moved by inclined projections h, bearing on the inclined recesses h' of the adjustable section A^2, which latter is guided by a guide-slot, h^3, on a fixed screw, h^2, of the folding-bar A. To impart the required degree of motion to the movable section A′, a lever, K, having a handle, K′, is pivoted to the folding-bar A, and the end of said pivoted lever connected by a pin, K^2, with the adjustable section A^2, said pin being guided in a slot, K^3, of the folding-bar A. A thumb-screw, K^4, clamps the lever K in position when the adjustment of the movable section A′ of the folding-bar by the lever K has been accomplished. By the pivoted lever K the lateral motion of the section A^2, and thereby the adjustment of the movable section A′ of the folding-bar, can be accomplished to a nicety, and thereby the edge of the sheet metal folded to different distances from the body of the sheet, according to the degree of adjustment given to the edge of the folding-bar A from the bar C. The different degrees of folding the edge of the sheet metal by the machine are clearly illustrated in Fig. 6.

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

1. In a machine for folding sheet metal, the combination, with a stationary plate, around the edge of which the sheet metal is to be folded, of a folding-bar, a swinging frame by which the folding-bar is supported, a spring-clamp below the stationary plate, and an adjustable gage back of said clamp, the clamp being provided with a continuous edge, and with recesses back of said edge for the projections of the gage, substantially as set forth.

2. In a machine for folding sheet metal, the combination, with a stationary plate around the edge of which the sheet metal is to be folded, of a folding-bar, a clamp below the stationary plate, a swinging frame by which the clamp is supported and in which the folding-bar is journaled, and an adjustable gage back of the clamp, said folding-bar being provided with two sections, a laterally-adjustable section and a hinged section, and with a pivoted lever connected to the laterally-adjustable section, and a clamp-screw for clamping said section after the same has been adjusted, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

NICOLAS KOENIG.

Witnesses:
EDWARD J. HARTMAN,
GEORGE SINNOTT.