(No Model.)

G. R. EVERSON.

SHEET METAL FOLDER.

No. 383,390. Patented May 22, 1888.

FIG. 1.

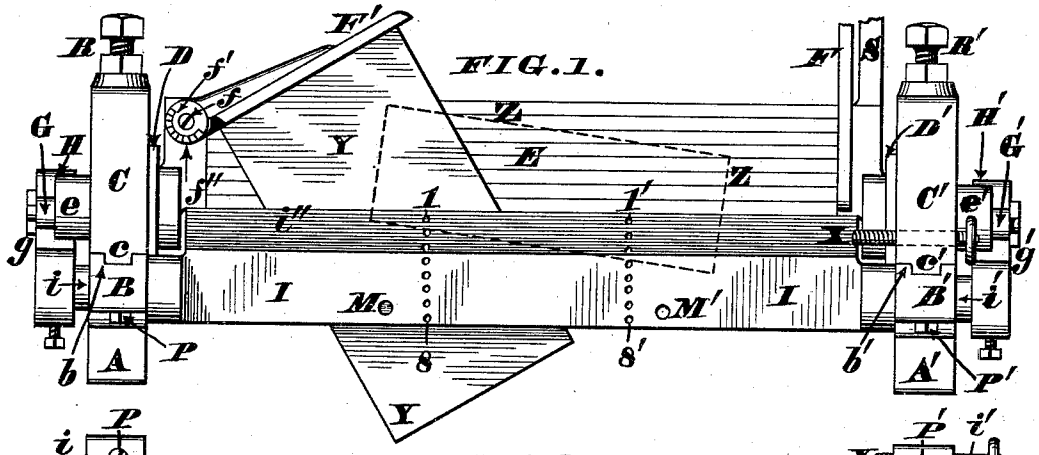


FIG. 2.

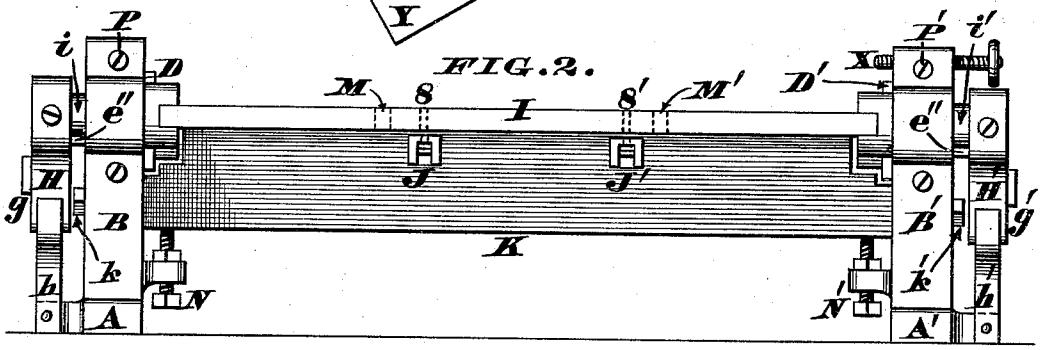


FIG. 3.

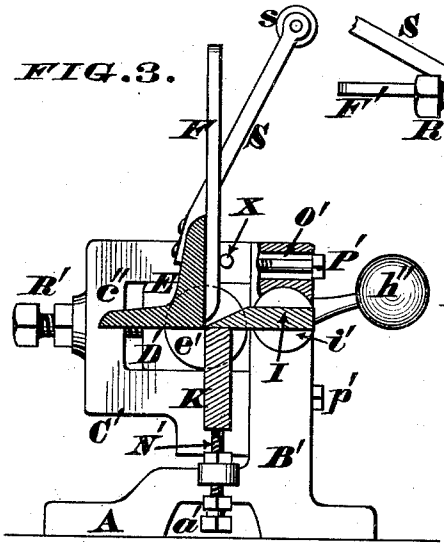


FIG. 4.

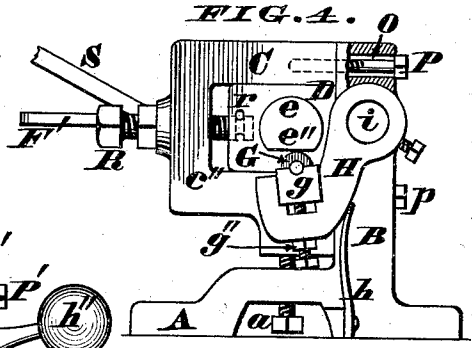


FIG. 5.

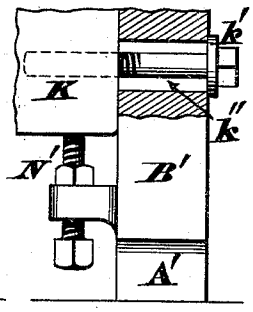


FIG. 6.

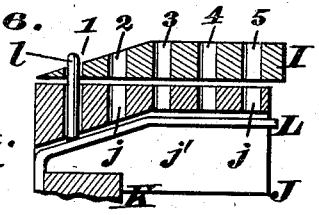


FIG. 7.

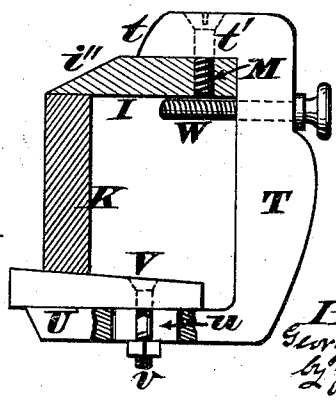
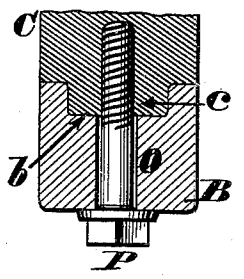


FIG. 8.



Attest.
S. S. Carpenter,
L. B. Speer.

Inventor.
George R. Everson.
by James A. Layman,
Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

GEORGE R. EVERSON, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-HALF TO WILLIAM L. ROCKENFIELD, OF SAME PLACE.

SHEET-METAL FOLDER.

SPECIFICATION forming part of Letters Patent No. 383,390, dated May 22, 1888.

Application filed March 6, 1888. Serial No. 266,335. (No model.)

To all whom it may concern:

Be it known that I, GEORGE R. EVERSON, a citizen of the United States of America, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Sheet-Metal Folders, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention comprises sundry improvements in those machines used for folding or bending tin and other sheet metals, the details of said improvements being hereinafter more fully described, and pointed out in the claims.

In the annexed drawings, Figure 1 is a plan of my improved folding-machine, a sheet of metal being inserted therein in an oblique manner preparatory to being bent. Fig. 2 is a rear elevation of said machine. Fig. 3 is a vertical section thereof, the folding-bar being turned up to a perpendicular position. Fig. 4 is an end elevation of the machine in the same position as seen in Figs. 1 and 2. Fig. 5 is an enlarged section of the adjusting devices of the bed-piece. Fig. 6 is an enlarged vertical section of the clamp-plate and a portion of the bed-piece, said section being taken in the plane of one of the removable gage-pins. Fig. 7 is a sectional elevation showing the clamp-plate united to the bed-piece by a detachable binder. Fig. 8 is an enlarged horizontal section through one of the standards and a portion of its connected housing.

A A′ represent foot-pieces from which project vertical standards B B′, the front edges of which are grooved respectively at *b b′*, to admit the tongues *c c′* of vertically-adjustable housings C C′, said housings being slotted at *c″*, to receive horizontally-adjustable journal-boxes D D′, within which latter are fitted the gudgeons *e e′* of the folding-bar E, and each of these gudgeons is provided with a single flat face, *e″*, as more clearly seen in Fig. 4. The upper surface of this folding-bar has a series of parallel lines cut in it, as seen in Fig. 1, which lines run longitudinally of said bar and serve as a gage when a piece of sheet metal is fed in at the rear of the machine. Furthermore, it is preferred to furnish this upper surface of the bar with an end gage to insure the sheet being fed in at a right angle to the clamping-plate, one form of such gages being shown at F, which is a simple rib projecting rigidly from said bar; but at F′ is seen a gage capable of being swung around at any desired angle, so as to arrest the sheet in an oblique position with reference to the clamping-plate. This gage is pivoted to the bar E at *f*, and has a graduated circle, *f′*, for indicating the angle, said graduations being used with any suitable index, which is here shown as an arrow. In some cases, however, a simple line, *f″*, at the end of the longitudinal lines of the bar E may be the only gage that is required. Adapted to bear constantly against the gudgeons *e e′* of the folding-bar are anti-friction rollers G G′, journaled in adjustable boxes *g g′*, which latter are fitted in the free ends of swinging arms H H′, and each box is shifted by a set-screw, one of the latter being seen at *g″* in Fig. 4.

h h′ are springs bearing against the arms H H′, although the function of these springs may be performed by the weight *h″*. (Seen in Fig. 3.) These arms are rigidly secured to the journals *i i′* of an ordinary clamping-plate, I, the front edge of which, *i″*, is chamfered off in the usual manner, said journals being passed through suitable bearings near the top of standards B B′. Clamping-plate I has a series of unthreaded perforations, numbered, say, from 1 to 8, or still further, if desired, and another series numbered from 1′ to 8′. These holes are supplemented by similar perforations, *j*, in the rearward extensions J J′ of the bed-piece K, said extensions being slotted, as seen at *j′* in Fig. 6, to admit a plate-spring, L, the fixed end of which is secured to the front of said bed-piece.

l is a removable gage-pin adapted to be passed down through the coincident holes of the clamping-plate and extensions and to rest upon the spring, and a similar pin is to be used with the other series of holes in said plate and extensions.

M M′ are screw-holes in said plate, for a purpose that will presently appear. The bed-piece K is secured to the housings C C′ by bolts *k k′*, which bolts traverse slots *k″* of the latter,

in order that said bed-piece may have a limited vertical adjustment, which shifting is effected by the set-screws N N'.

O O' are vertical slots in the standards B B', to admit bolts P P', that engage with the upper part of housings C C', similar slots being employed to receive other bolts *p p'*, that are tapped into the lower portion of said housings, the latter being adjusted by the set-screws *a a'* of the foot-pieces A A'.

R R' are set-screws for advancing and retracting the journal-boxes D D' within said housings, the inner ends of said screws being grooved circumferentially to admit a pin, *r*, as seen in Fig. 4, which pin prevents disengagement of the screw R', and yet allows it to turn freely.

S is a lever for operating the folding-bar E, the free end of said lever being furnished with a handle, *s*. (Seen only in Fig. 3.)

T in Fig. 7 represents a binder having at top a branch, *t*, which rests upon the clamping-plate I, being secured thereto by a screw, *t'*, that engages with the threaded hole M of said bar, the lower end of said binder having a limb, U, slotted at *u* to receive a screw, *v*, wherewith a wedge, V, is adjustably attached to said limb. Wedge V is adjusted to bear against the under edge of bed-piece K, and thus prevents the clamping-plate I springing in the center.

W is a stop-screw engaged with this binder, which screw limits the insertion of a metallic sheet from the front of the machine. A precisely similar binder is to be attached at the other screw-hole, M'.

X is a stop-screw tapped in the housing C', said screw being retracted in Fig. 2, but being advanced in Figs. 1 and 3, so as to arrest the folding-bar E in a vertical position, and thus insure the bending of the metallic sheet at a right angle.

When my machine is in its normal position, the stress of springs *h h'*, or the weight of ball *h''*, causes the clamping-plate I to turn on its journals *i i'* until the anti-friction rollers G G' are brought in contact with the flat faces *e''* of the gudgeons *e e'*, which act causes said plate to recede far enough from the bed-piece K to admit a sheet of metal, as seen in Fig. 6, which sheet may be inserted from the rear, if desired, after the pins *l* have been removed. The operator then inserts the sheet and brings its front edge to the proper line on the folding-bar E, which line serves as a gage to determine the exact width of the fold or bend. Lever S is then pulled rearward, in the usual manner, and the moment this movement is initiated the gudgeons *e e'* press down upon the rollers G G', thereby causing the sheet to be immovably clamped between the plate I and bed-piece K. The still further movement of this lever bends the sheet over the chamfered edge *i''* of said plate and completes the operation. If the sheet Y is not to be bent parallel with its front edge, the gage F' is swung around and secured at the desired angle, and then said sheet is fed in, as seen in Fig. 1; but when it is desired to feed in at the front of the machine the pins *l* are dropped into their appropriate holes to serve as stops for the entering edge of the sheet to rest against. When the sheet is bent, it presses down upon the exposed ends of said pins, thereby causing the spring L to yield until said ends are flush with the upper surface of the clamping-plate. Consequently there is no danger of said pins being bent or broken, and they have the still further advantage of gaging the sheet obliquely. To do this, a pin is inserted—say in the second hole of the row of perforations 1 8—and another pin is dropped into the fourth hole of the other row of perforations, 1' 8'. The sheet is then fed in in the oblique manner indicated by the dotted line Z. To turn a large or gradual bend on the sheet, the bearings D D' are advanced or moved away from clamping-bar I within the housings C C', while the retraction of said bearings produces a sharp or angular turn of said sheet. The elevation or depression of these housings and the independent adjustment of the bed-piece K allow any lost motion in the machine to be readily compensated for. Finally, the binders, of which one is seen in Fig. 7, are to be used only when thick heavy sheets are fed in at the front of the machine, at which time the wedges V of said binders are so adjusted as to couple the clamping-plate I very firmly to the unyielding bed-piece K. Consequently this bed-piece holds the clamping-plate rigidly in a horizontal position and prevents it being bowed or sprung upwardly in the center in the act of bending the sheets; but after these sheets have been bent screws *t'* are disengaged from the threaded holes M M', and the binders are detached, so as to allow the machine to be again used in the customary manner.

I claim as my invention—

1. A sheet-metal folder provided with a swinging gage at one end of the folding-bar, for the purpose described.

2. A sheet-metal folder provided with a swinging gage at one end of the folding-bar, said gage being furnished with a graduated circle, for the purpose herein described.

3. The combination, in a sheet-metal folder, of a pair of vertically-adjustable housings that carry laterally-shiftable journal-bearings of the folding-bar, for the purpose described.

4. The combination, in a sheet-metal folder, of the folding-bar E, having at its opposite ends flat-faced gudgeons *e e'' e' e''*, that bear upon anti-friction rollers G G', journaled in boxes *g g'*, fitted to the free ends of arms H H', said arms being attached to the journals *i i'* of the clamping-plate I, and being provided with set-screws *g''*, wherewith said boxes are adjusted, as herein described.

5. The combination, in a sheet-metal folder, of vertically-grooved standards B *b* B' *b'*, vertically-tongued housings C *c* C' *c'*, slots O O',

bolts P P′, and adjusting-screws *a a′*, said housings having the folding-bar E journaled in them, for the purpose described.

6. The combination, in a sheet-metal folder, of the detachable binder T, having a branch, *t*, retaining-screw *t′*, limb U, slot *u*, wedge V, screw *v*, and gage-screw W, for the purpose described.

7. In a sheet-metal folder, the clamping-plate I, having two sets of perforations, 1 8 and 1′ 8′, in combination with the perforations *j*, spring L, and removable pin *l*, for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE R. EVERSON.

Witnesses:
JAMES H. LAYMAN,
SAML. S. CARPENTER.