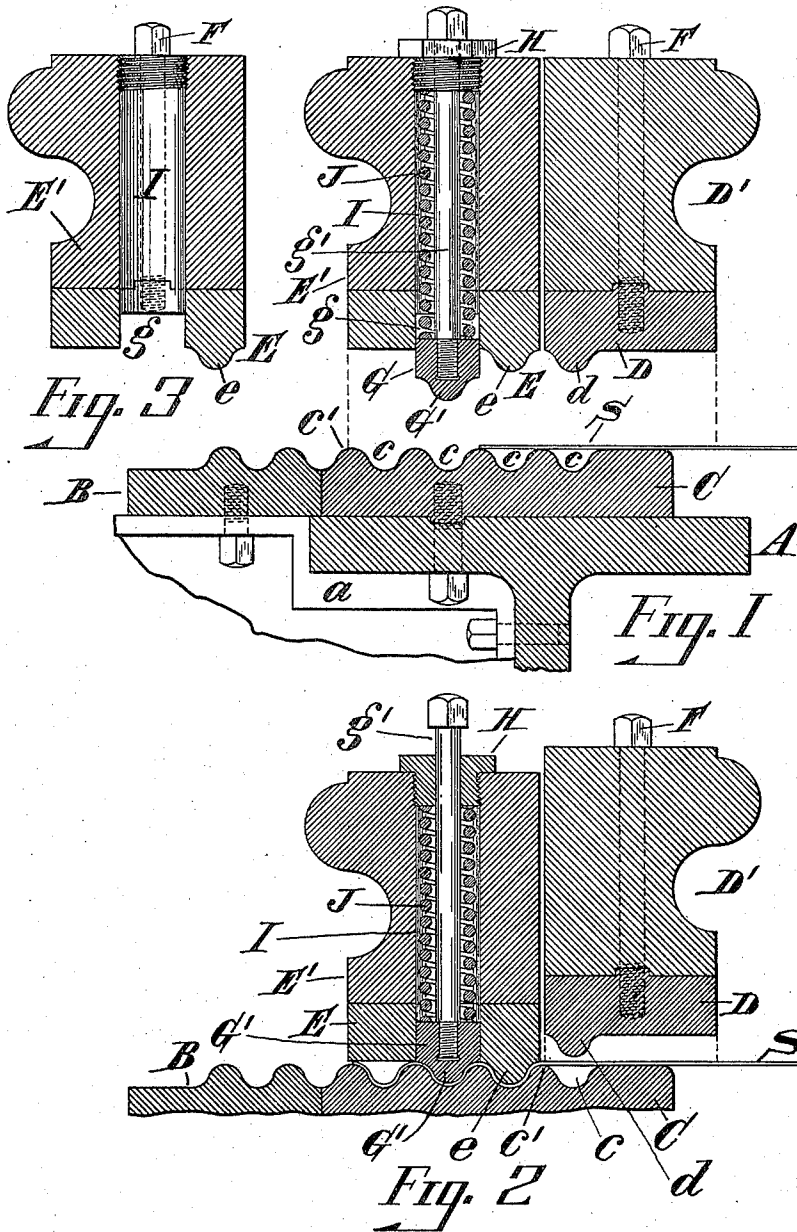


(No Model.)

C. J. COLLING.
PRESSURE DIES FOR CORRUGATING SHEET METAL.
No. 577,597.

Patented Feb. 23, 1897.



WITNESSES

Sherwood R. Paylor
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UNITED STATES PATENT OFFICE.

CHARLES J. COLLING, OF CINCINNATI, OHIO, ASSIGNOR TO J. M. ROBINSON & CO., OF SAME PLACE.

PRESSURE-DIES FOR CORRUGATING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 577,597, dated February 23, 1897.

Application filed May 27, 1896. Serial No. 593,214. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. COLLING, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Pressure-Dies for Corrugating Sheet Metal, of which the following is a specification.

My invention relates to improvements in pressure-dies for corrugating sheet metal; and it consists in the novel features of construction hereinafter fully described, and particularly pointed out in the claim.

In the accompanying drawings, Figure 1 is a transverse section of my improved dies, showing them in their open normal position with an unworked sheet in its initial position on the lower die ready for the formation of the first two corrugations and with the base or table broken off; Fig. 2, a transverse section (with the table omitted) of the same dies, but showing them in action, one of the plunger or upper dies being in pressing contact with the sheet and the other plunger-die just in the act of following it in the same downward stroke, said sheet having advanced to the formation of the third and fourth corrugations, and this view especially showing the action of my presser-bar device for holding the sheet while the accompanying dies are performing their work; and Fig. 3, a transverse section of the front upper die (the one to the left in Figs. 1 and 2) and its beam, showing (in dotted lines) the manner in which they are united, and also showing the longitudinal guideway for the presser-bar and the chamber for one of its spiral springs, said presser-bar and its accessory parts being omitted.

A represents the base or table of the machine, from whose fore edge projects a number of brackets *a*, (one only being shown,) which support the usual longitudinal gage plate or table B.

C represents the lower die, composed of a bar or plate suitably secured to the upper face of table A and having its surface corrugated or constructed with a longitudinal series of parallel grooves *c* and elevations *c'* of the size and contour to suit the desired corrugations or crimps to be produced. The face of gage-

plate B is partially fluted or furrowed similar to that of the lower die, the latter being set up against it with the flutes duly registering.

My upper die is a twin or double-plunger one, being composed of a pair of dies D and E, respectively, lying parallel and adjacent to each other, but independent of each other for independent action, and suitably secured to the lower faces of the plunger-beams D' and E', respectively, vertical screw-bolts F being preferred, for detachability, as seen in dotted lines in the several views.

The rear upper die D has a longitudinal elevation *d* on its lower face, along its fore edge, and the fore upper die E has a similar elevation *e* on its lower face, along its rear edge, adjacent that of the die D. These protruding portions of the upper dies correspond to those of the lower die and engage or fit the grooves *c* of the latter, as usual, in operation.

G represents an auxiliary longitudinal presser-bar engaging a groove or guideway *g*, made in the fore upper die-bar E, parallel to and immediately adjacent the die elevation *e* and detachably supported by means of two or more vertical screw-bolts *g'*, (one only being shown,) the latter passing freely downward through gland-nuts or headed bushings H, which are screw-threaded and engage the threaded upper ends of vertical holes or chambers I, made in the plunger-beam F' and the die-bar E at such intervals apart as shall suit the length of said upper die and its accompanying presser-bar.

J is a spiral spring surrounding the shank of each screw *g'* within the chambers I and normally resting in said chambers in their open expanded condition between the bushings H and the presser-bar G, thereby duly exerting the desired pressure to hold said presser-bar extended to almost its full thickness beyond the flat face of the body of die-bar E, as best seen in Fig. 1, which is its normal position.

The lower face G' of the presser-bar corresponds to that of the die formations *d* and *e*, so as to match the furrow or corrugation (in line with it) made in the lower die.

In operation the flat sheet S is placed horizontally between the dies with its fore portion

resting on top of the lower die and with its fore edge approximately half-way across the second corrugator elevation *d*, (just out of line of movement of the rear lower edge of presser-bar G.) The plunger-dies being mounted in any suitable frame and having double-cam or other similar duly-timed power mechanism applied, (not shown herein, as it is common to powerful presses of this kind and not necessary to encumber the drawings with,) may now be lowered, thereby bringing the presser-bar into yielding contact with its furrowed corrugation in the lower die about simultaneous with the contact of fore die formation *d* with the fore portion of the sheet. The fore plunger being still further advanced, the said die formation *d* sinks into its corresponding cavity in the lower die and carries with it the intervening sheet metal to form the first full corrugation, and the twin rear plunger, which immediately follows said fore plunger, and during the same downstroke, advances into the sheet metal to the rear of said first full corrugation, and its die *e* forms the next full corrugation, all during said single downstroke of the twin plungers, and as best seen in Fig. 2, where the fore plunger is shown as having completed its portion of said downstroke and the rear plunger is just about to force its die formation into the sheet to make the next full corrugation in the said single downstroke of the plungers or twin upper dies. In said Fig. 2 I show how the presser-bar G engages the second full corrugation and holds the sheet firmly by the expansive or downwardly-pressing action of its springs J while the next succeeding pair of corrugations are being formed by the working dies *d* and *e*, and preventing the slipping thereof laterally or

otherwise. This presser-bar acts automatically and on the upstrokes of the plungers serves as a stripper for the upper dies and sheet, as its springs hold it and the sheet down till the dies have cleared said sheet. The presser-bar is conveniently applied to place in the plunger E from below. The spiral springs are then placed in the chambers I. The screw-bushings are then turned tightly down into the tops of said chambers and serve as back-stops for said springs; and, finally, the screw-bolts *g'* are passed downwardly and secured to the presser-bar through said bushings, in which latter they reciprocate freely up and down in the yielding movement of the presser-bar against the springs.

I claim—

In a press for corrugating or crimping sheet metal, the combination of a rigid lower die having three or more formations thereon; a pair of upper dies mounted on independent vertically-moving beams or plungers and each adapted to coact with a separate corrugation of the lower die to form complete or whole crimps or corrugations in the metal at each downstroke thereof; and a suitably-formed, spring-controlled presser-bar engaging a longitudinal guideway in the fore-die plunger-beam and supported on vertical bolts and bushings in the said fore plunger; substantially as and for the purpose herein set forth.

In testimony of which invention I have hereunto set my hand.

CHARLES J. COLLING.

Witnesses:

JOHN E. JONES,
H. LOCKE.