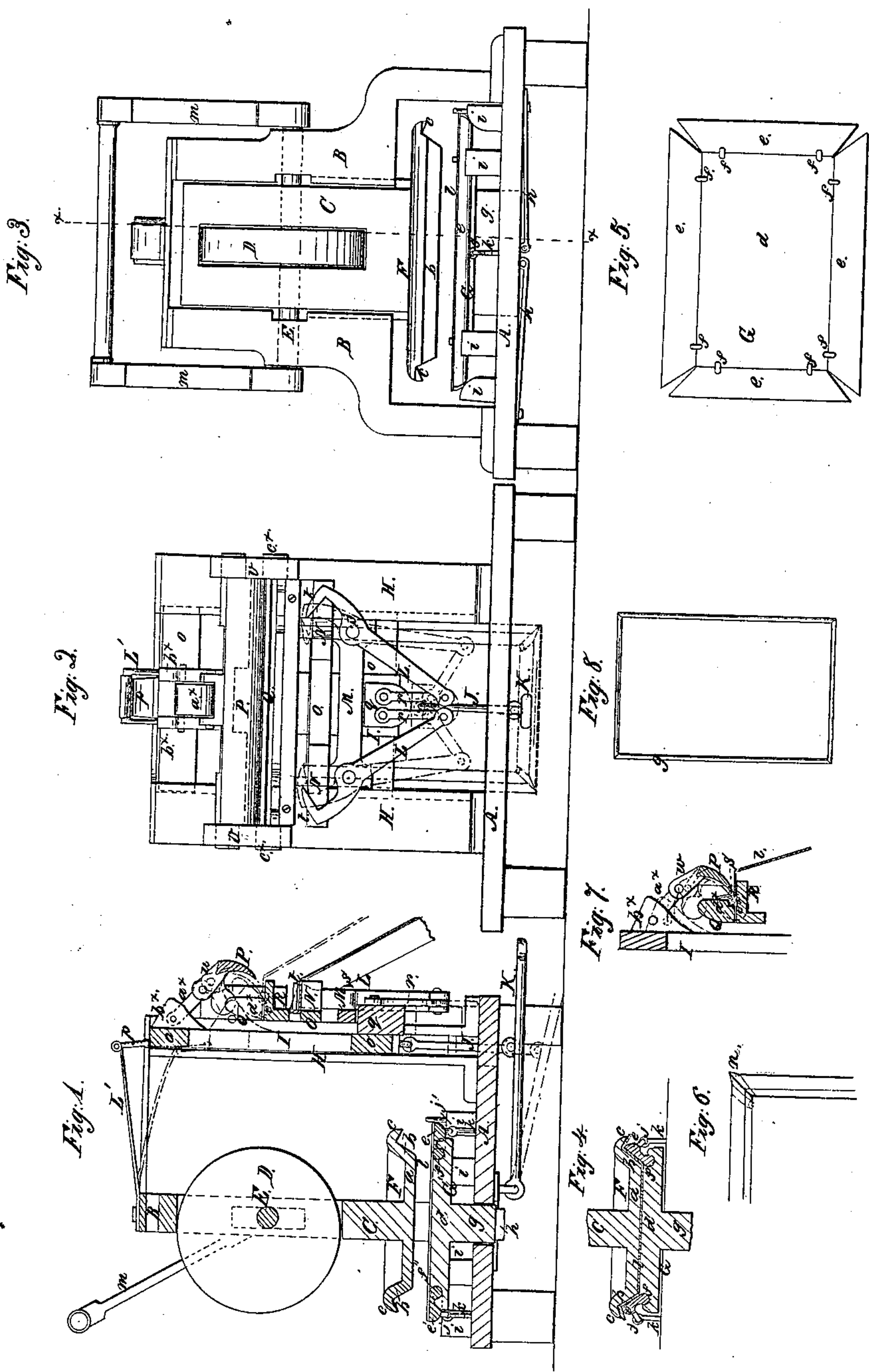


E. A. Smead,
Making Sheet-Metal Pans.
N^o 19,517. *Patented Mar. 2, 1858.*



UNITED STATES PATENT OFFICE.

E. A. SMEAD, OF TIOGA, PENNSYLVANIA.

IMPROVED MACHINE FOR FORMING SHEET-METAL PANS.

Specification forming part of Letters Patent No. 19,517, dated March 2, 1858.

To all whom it may concern:

Be it known that I, E. A. SMEAD, of Tioga, in the county of Tioga and State of Pennsylvania, have invented a new and improved device or machine for forming rectangular sheet-metal pans or vessels with vertical or beveled sides, such as are used for culinary purposes; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical section of my improvement, *xx*, Fig. 3, showing the plane of section. Figs. 2 and 3 are elevations of the same, taken at opposite sides of the machine. Fig. 4 is a detached transverse section of the formers. Fig. 5 is a detached plan or top view of the lower former. Fig. 6 is a view of a portion of a pan or vessel. Fig. 7 is a detached transverse section of the wiring device enlarged. Fig. 8 is a detached view of the wire bent in proper form corresponding to that of the pan or vessel.

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

The invention consists in the employment or use of two dies or formers, one of which is attached to a plunger, and may be termed a "male" die or former. The other, which may be termed a "female" die or former, is provided with jointed sides, and works within guides which actuate said sides, the above parts being so arranged and operating that the body of the pan or vessel will be formed or swaged at a single operation from a plate of sheet metal.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents a rectangular base, on which two vertical guides, B B, are secured. Between these guides a frame, C, is fitted and works. This frame is of rectangular form, and has a cam, D, fitted or placed within it. This cam D is formed of a circular block; or it may be described as a wheel placed eccentrically on a shaft, E, which passes horizontally through the guides B B and through oblong slots made in the frame C.

To the lower end of the frame C a die or former, F, is attached. This die or former

may be described as being of the precise shape of the pan or vessel to be formed. The die or former F may be cast in a single piece. By referring to Figs. 1, 3, and 4 its form will be distinctly understood. *a* is the bottom, which is a rectangular plane corresponding in size to the bottom of the pan to be formed. *b* are the sides, which are inclined, their upper ends, *c*, projecting outward, and having their under surfaces at right angles with the inclined portions *b*. It is not necessary that the die or former be solid. It may be a shell of requisite thickness to insure a proper degree of strength.

G represents the female die or former. This die is formed of a plate, *d*, the upper surface of which corresponds in size to the plate or bottom *a* of the upper die or former.

To each side or edge of the plate *d* a side piece or strip, *e*, is attached by joints *ff*. The inner surfaces of these side pieces are planes; but their outer sides are rounded or curved, as shown more particularly in Figs. 1 and 4. The plate *d* is attached to the upper end of a guide-block, *g*, which works through the base A, and has springs *h h* bearing against it, said springs being attached to the under side of the base.

To the upper surface of the base A there are attached guides *i*. The inner or face sides of these guides are of rounded form, and encompass the die or former G, so that when said die or former is in an elevated state the edges of the side pieces or strips will bear or rest upon the upper parts of the guides *i*, as shown clearly in Figs. 1 and 3. Each side piece or strip *e* is connected by a joint, *j*, to the upper end of an elastic or yielding rod, *k*. The ends of the side pieces or strips, *e*, at the angles of the plate, are not in contact when the pieces or strips are in a horizontal position, the ends forming angles of forty-five degrees with the edges of the pieces or strips. The object of this is to allow the ends of the pieces or strips to be in contact with each other when the plate *d* is depressed, as will be hereinafter referred to.

The operation is as follows: A sheet-metal plate, *l*, (shown in blue,) is cut of the required size, which size is equal to the area of the plate *d* and distended side pieces, *e*, of the lower die, G. (See Fig. 1.) The die G is kept in

an elevated position by the springs *h* when the die *F* is raised. When the plate *l* is placed on the lower die, *G*, as shown in Fig. 1, the upper die, *F*, is depressed by turning the cam *D*, which operation is effected by levers *m*, attached to the end of the shaft *E*. When the plate or bottom *a* of the die *F* strikes the plate *l*, the die *G* is forced downward, and the side pieces, *e*, as the plates *a d* descend, are pressed inward in consequence of the bearing of their outer edges against the guides *i*, and the edges of the plate *l* will be bent by the side pieces, *e*, against the sides *b* of the upper die, *F*, and when the upper die, *F*, is fully depressed the upper parts *c* of the sides *b* will bend over the upper parts of the sides of the plate, as shown clearly in Fig. 4. In thus bending the plate *l* it will be seen that the superfluous metal at the corners of said plate *l*, or what may now be termed the "body" of the pan or vessel, will be compressed, and will project out from the body, as shown clearly at *n* in Fig. 6. When the levers *m m* are relieved or set free, the die *G* will rise by the action of the springs *h*, the body of the pan or vessel is removed, and another plate placed on the die *G* for a succeeding operation. The dies form the body of the pan or vessel only; they do not complete it. The projections *m* require to be bent over against the sides of the pan, and the upper ends of the sides require to be wired.

The projections *n* are bent over and against the sides of the body of the pan or vessel by the following means: On the base *A* two uprights, *H H*, are secured. Between these two uprights *H H* two cross-heads, *o o*, are fitted and connected by a vertical bar, *I*. The cross-heads are allowed to work freely up and down between the uprights *H H*, and the lower cross-head is connected by a rod, *J*, with a treadle, *K*. The upper cross-head is connected by a link, *p*, with a spring, *L'*, which has a tendency to keep the cross-heads *o o* elevated.

To the lower end of the bar *I* a block, *g*, is attached, as shown clearly in Fig. 1 and 2, and to this block the upper ends of two arms, *r r*, are pivoted. The lower ends of the arms *r* are pivoted to the lower ends of levers *L L*, which work on pivots or fulcrum-pins *s*, which are fitted in a fixed horizontal bar, *M*, attached to the uprights *H H*, a pin *s* being near each end of the bar *M*. The upper ends of the levers *L L* are provided with lips or jaws *t*, one on each lever. These lips or jaws form right angles with the levers *L*, and when the treadle *K* is depressed they are forced over the upper surfaces of blocks or beds *N*, which are attached to or formed on a horizontal bar, *O*, attached to the uprights *H H*. It will be seen that the levers *L L* are actuated as the bar *I* is depressed by the arms *r r*.

After the body of the pan is formed as previously described, its ends are fitted or placed over the block or beds *N*, as shown in blue, Figs. 1 and 2, and, the treadle *K* being then depressed by the foot, the levers *L L* are moved

or actuated, and the lips or jaws *t* are forced over the blocks or beds *N*, and bend and press down snugly the projections *n* against the sides of the body of the pan or vessel, as shown in red, Fig. 6.

To complete the pan or vessel, the upper ends of its sides require to be wired. This is effected as follows: To the upper ends of the uprights *H H* bearings *v v* are attached. In these bearings the axes of a segment pressure-bar, *P*, are fitted. This bar transversely is of segment form, as shown clearly in Fig. 1, and is connected by arms *w* to its axes or journals. The bar *P* is connected by a link, *a**, to the bar *I*, and two inclined or beveled projections, *b**, are attached to the upper end of the bar *I*, as shown in Figs 1 and 2.

Between the two bearings *v v* a bar, *Q*, is placed. The ends of this bar are provided with journals *c**. The lower front edge of the bar *Q* has a longitudinal rabbet or gain, *d**, made in it, as shown clearly in Figs. 1 and 7. The journals *c** are placed at the lower parts of the ends of the bar *Q*, and near its front side, so that the center of motion of the bar *Q*, or the line of its axis, will be at the lower part of the front side of the bar, as shown at *e**. (See Fig. 7.)

Directly below the bar *Q* a fixed horizontal bar or bed, *R*, is placed. This bar or bed is attached to the uprights *H H*.

The wire *S* is bent in quadrilateral form, as shown in Fig. 8, and is placed underneath the upper bent edges of the sides of the pan or vessel, and these upper edges are placed (one at a time, of course) upon the bed *R* and below the segment-bar *P*, as shown clearly in Fig. 7. The treadle *K* is then depressed, and the bar *I*, as it descends, throws the segment-bar *P* down in consequence of the attachment of the bar *I* to the segment-bar *P* by means of the link *a**. This bar *P* forces the bent edge of the side of the pan or vessel *l* and also the wire into the recess or gain *d** in the bar *Q*, as shown in red, Fig. 7, and when in this position the bed *R* is moved outward by the action of the link, and at the same time the oblique sides of the projections *b** will actuate the bar *Q* and cause the edge *f'* at the upper part of the gain to clew the edge of the side of the pan or vessel snugly over the wire, as shown in red, Fig. 1. The edges of the four sides of the pan or vessel are closed successively around the wire, and the pan or vessel is then completed.

The device for folding or bending over the projections *n* after the body of the pan or vessel is formed, and also the device for wiring, are necessarily described in this specification, for they are both essential in order to complete the work; but, as these devices are not operated conjointly, the folding and wiring devices legitimately form subjects for separate applications, therefore I do not claim such parts in this application.

I am aware that dies have been used for swaging or forming dishes, cups, boxes, and

similar articles; and I do not claim, broadly, the employment of dies without reference to the peculiar arrangement and construction of the same; but,

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

The combination of the two dies F G, when arranged as shown—viz., the lower die, G, being

provided with the movable side pieces or strips, *e*, actuated by the guides *i* as the die descends, the upper die being attached to the frame C, actuated by the cam D, or its equivalent, for the purpose specified.

E. A. SMEAD.

Witnesses:

C. H. PLACE,
F. CAREY.