

Sept. 18, 1923.

C. T. WOOTTEN

1,468,549

DIE

Filed Dec. 24, 1920

4 Sheets-Sheet 1

Fig. 14.

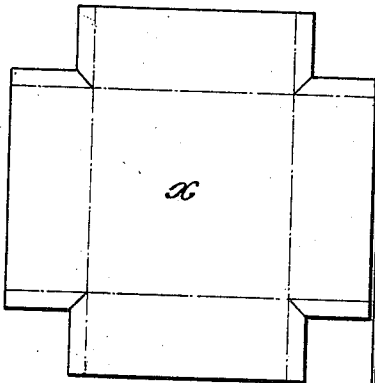


Fig. 15.

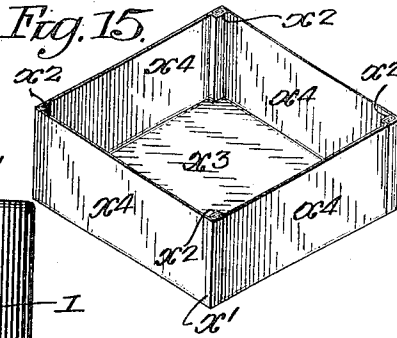


Fig. 1.

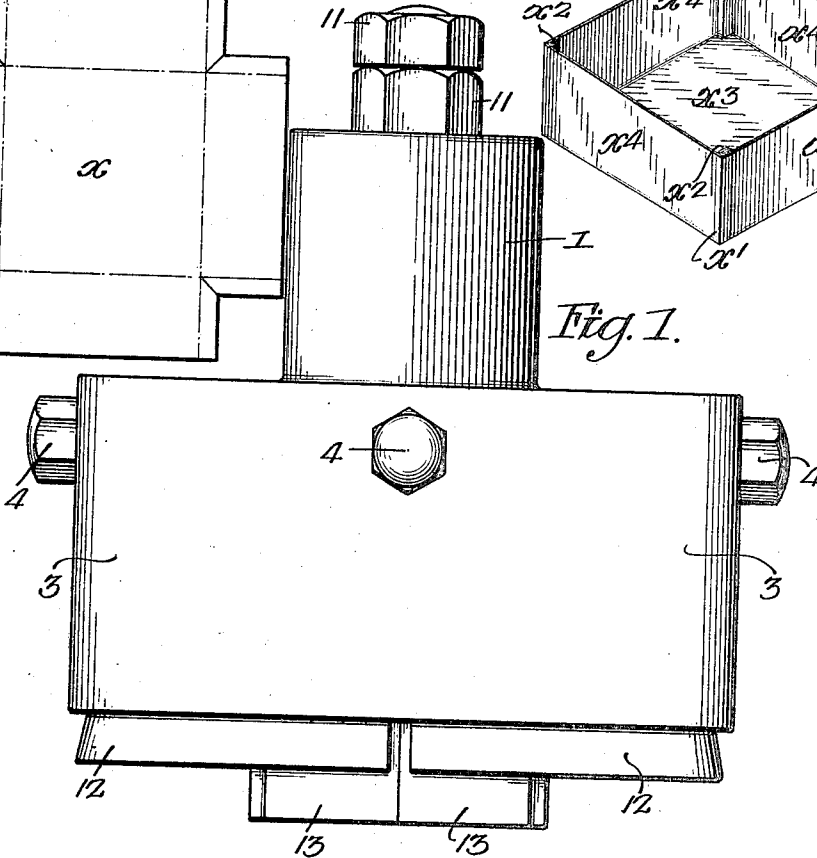
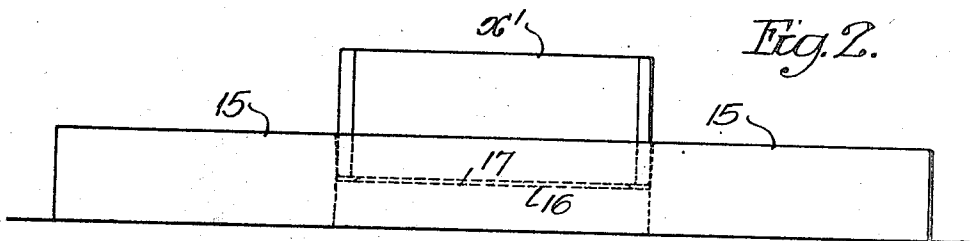


Fig. 2.



David Bowers, Executor of
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by His Attorneys.—
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Fig. 3.

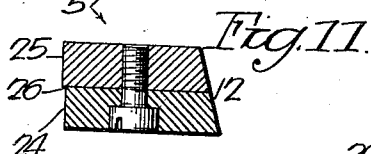
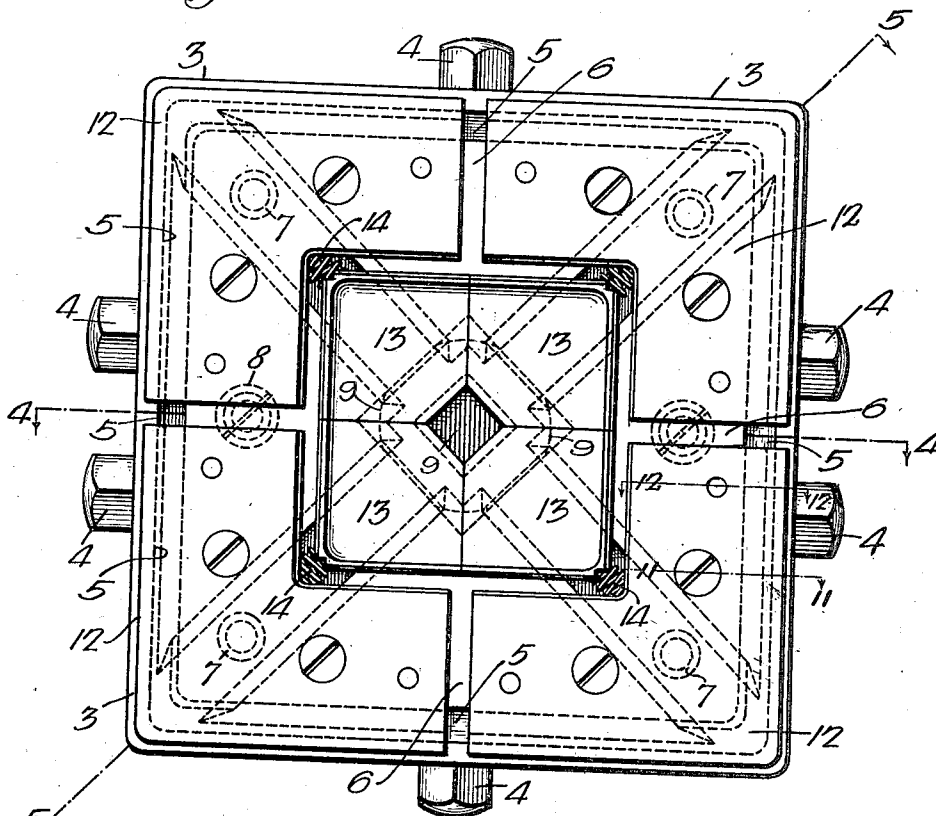
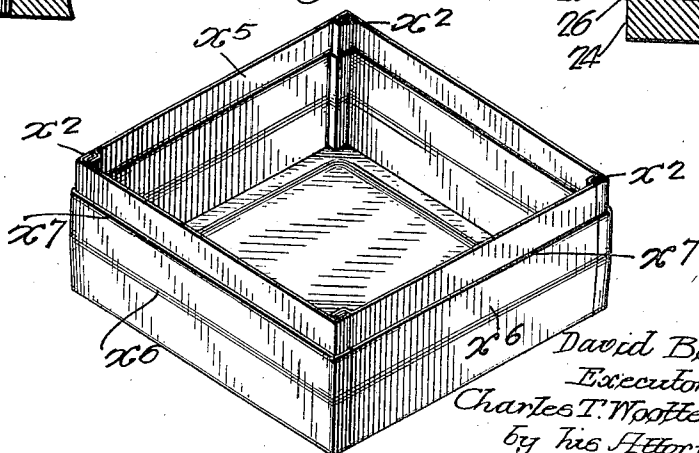
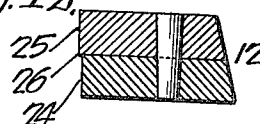


Fig. 16. Fig. 12.



David Bowers,
Executor of
Charles T. Wootten, deceased,
by his Attorneys,
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Fig. 13.

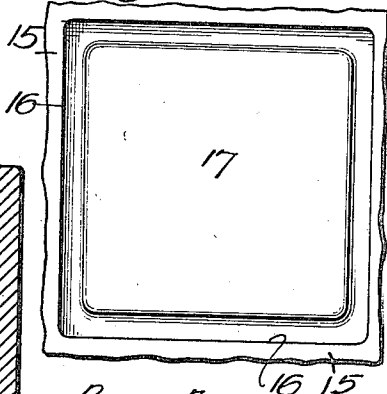
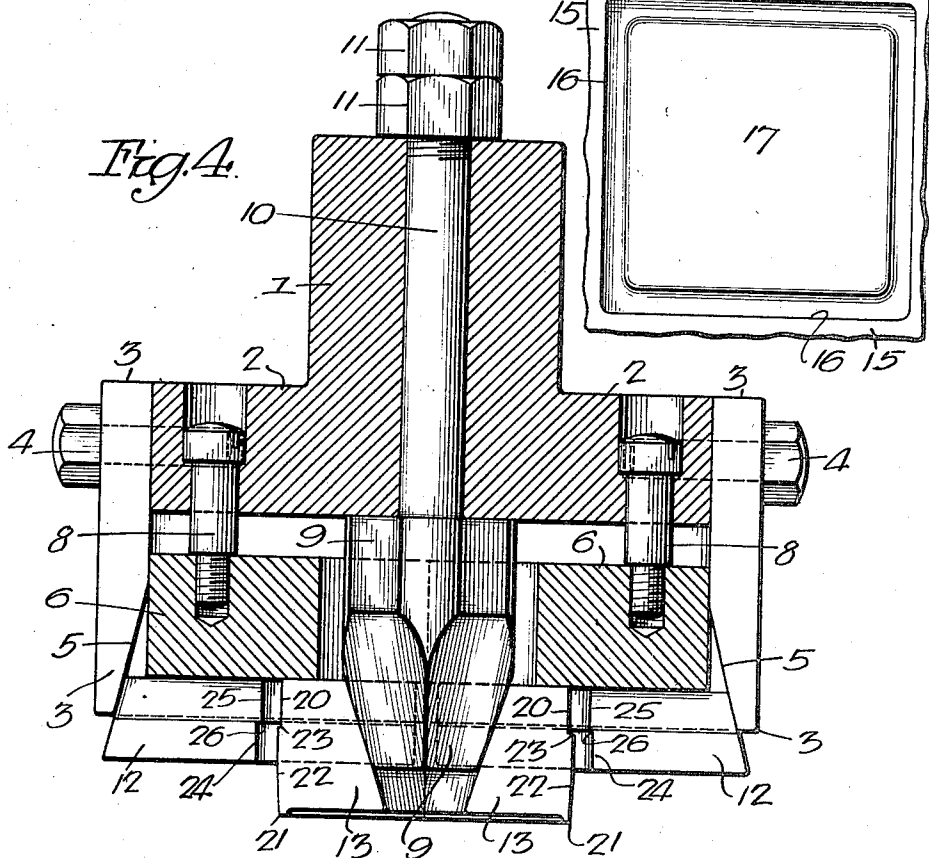
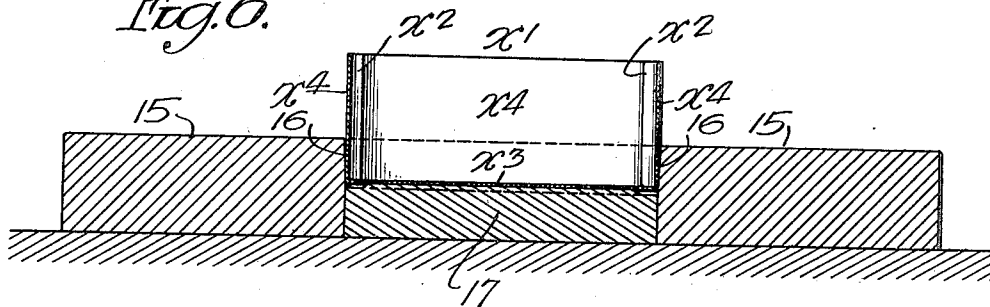


Fig. 6.



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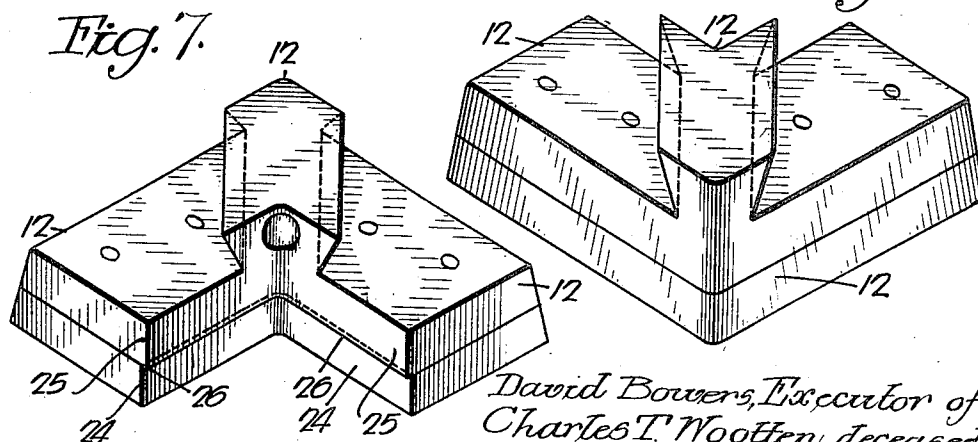
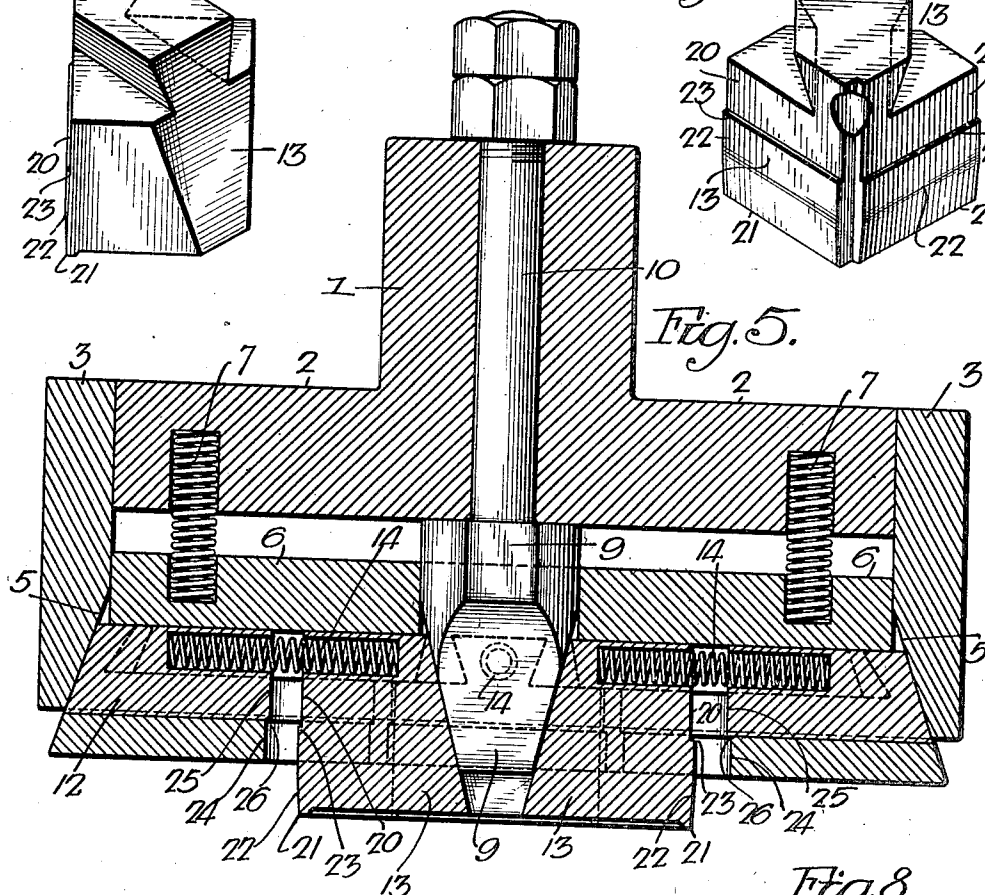
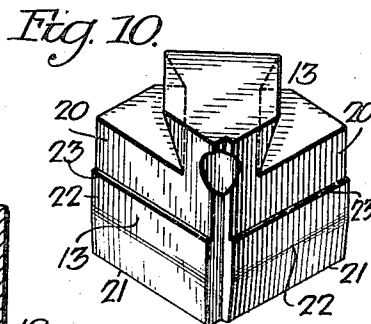
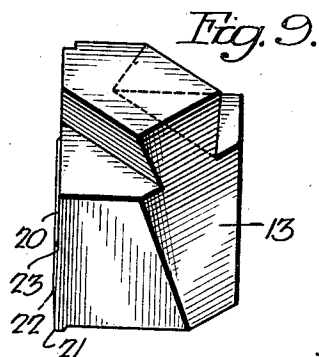
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David Bowers, Executor of
Charles T. Wootten, deceased,
by his Attorneys—
Howson & Howson

Patented Sept. 18, 1923.

1,468,549

UNITED STATES PATENT OFFICE.

CHARLES T. WOOTTEN, DECEASED, LATE OF PHILADELPHIA, PENNSYLVANIA; BY
DAVID BOWERS, EXECUTOR, OF LAUREL SPRINGS, NEW JERSEY, ASSIGNOR TO
MANUFACTURING COMPANY OF AMERICA, OF PHILADELPHIA, PENNSYLVANIA,
A CORPORATION OF PENNSYLVANIA.

DIE.

Application filed December 24, 1920. Serial No. 433,001.

To all whom it may concern:

Be it known that CHARLES T. WOOTTEN, formerly a citizen of the United States, residing in Philadelphia, Pennsylvania, but now deceased, did during his lifetime invent the Die of which the following is a specification.

This invention relates to a novel combination of parts constituting a die particularly designed to shape the bodies of sheet metal boxes from previously formed, box-like blanks, and one object of said invention is to provide a relatively simple and substantial device for bulging or pressing outwardly a portion of the sides of the box blank in order to provide the same with a neck for the reception of a flanged cover;—the arrangement of parts being substantial, durable and so designed and assembled as to perform their desired functions without wrinkling or cutting the sheet material of the blank.

It is further desired to provide a die having the above characteristics which will draw the metal of the bottom of the box blank in such manner as to provide the latter with a panel either at the same time that its sides are drawn to form a neck for the reception of the flanges of a cover or at some other time, the whole being so constructed and designed that the finished box body shall be perfect in form, i. e.,—without tendency to buckle or warp and free from wrinkles or folds.

These objects and other advantageous ends I attain as hereinafter set forth, reference being had to the accompanying drawings, in which,

Fig. 1 is a side elevation of a die constructed in accordance with my invention;

Fig. 2 is a side elevation of the die used with the die of Fig. 1;

Fig. 3 is an inverted plan of the die shown in Fig. 1;

Figs. 4 and 5 are vertical sections on the lines 4—4 and 5—5, Fig. 3;

Fig. 6 is a central vertical section of the lower die shown in Fig. 2;

Figs. 7 and 8 are perspective views of one of the four outer die elements forming part of my invention;

Figs. 9 and 10 are perspective views of one of the four inner die elements;

Figs. 11 and 12 are vertical sections on the lines 11—11 and 12—12, Fig. 3;

Fig. 13 is a fragmentary plan of the lower die;

Fig. 14 is a plan of the sheet metal blank as cut from flat sheet material;

Fig. 15 is a perspective view of the box blank upon which my invention is designed to operate; and

Fig. 16 is a perspective view of the finished box body.

In the above drawings, the die constituting my invention is shown in the present instance as having a head 1 of cylindrical form and provided with an outwardly extending rectangular flange 2 which has a two part rectangular depending sleeve 3 rigidly held to it by a series of bolts 4. The lower inner edge of said sleeve is inwardly and upwardly bevelled as indicated at 5 and in the chamber defined by it and by the flange 2 of the head is mounted a vertically slidable block 6 acted on by springs 7 between it and said flange, tending to force said block downwardly. Stud 8 having heads counter-sunk in the flange 2, extend through the latter into the block 6 to limit its downward movement under the action of the springs.

The block 6 has a central opening through which extends a square pyramidal member 9 held in place by a stem 10 extending through the head 1 to the upper end thereof, where it has mounted on it a pair of retaining nuts 11. These rigidly hold said member with its diagonals midway between the diagonals of the sleeve 3.

The pointed or pyramidal end of the member 9 extends below the block 6 which has formed in its under face two diagonally extending undercut guideways. In each guideway are mounted two pairs of forming dies of which the dies 12 and 13 of each pair are operative between the pyramidal member 9 and the inclined face 5 of the sleeve 3, being normally pressed apart by springs 14 and of such dimensions that their adjacent portions are spaced apart as long as the supporting block 6 is in its lower position.

Each of the outer die blocks 13 has an L-shaped form and its outer edges are bevelled or inclined so as to lie parallel and cooperate

with the inclined face 5 of the sleeve 3. Similarly the inner sides or faces of the die blocks 13 are likewise inclined to lie parallel and cooperate with the inclined sides of the member 9. The arrangement of parts is such that when the die blocks 12 and 13, with their supporting block 6, are forced upwardly toward the head 1, the sleeve 3 and pyramidal member 9 act to force the die blocks of each pair toward each other, against the action of the springs 14, and when said parts move away from the head, the die blocks of each pair are separated by said springs. The four die blocks 13 when moved toward each other by the action of the springs 14, are of such dimensions as to freely enter a box blank of the construction shown in Fig. 15, and they project below the plane of the under faces of the outer die blocks 12.

The blank body shown in Fig. 15 is formed by a suitable machine from a flat sheet metal stamping w having the outline shown in Fig. 14, and by said machine its four projecting parts are turned at right angles and their adjacent edges are interlocked as indicated at w^2 . The bottom w^3 and sides w^4 are plane and said blank, in order to be operated on by the die above described, is mounted in a suitably supported lower die 15 having a central rectangular recess, at the bottom of which is mounted a die block 17 (Figs. 6 and 13) formed with a marginal depression extending around its four sides.

In accordance with my invention, the upper portions of the outer sides of each of the die blocks 13 have a flat marginal depression 20 in each of their two operative sides, and the flat faces of these depressions lie in planes including the adjacent bottom edges 21 respectively. The portion 22 of each side between said bottom edge 21 and the top depression 20 extends outwardly beyond this plane and there is formed between each of these portions 22 and the adjacent depression 20 a shoulder whose width in the present instance is substantially equal to the thickness of the metal operated on.

The inner angle of each of the die blocks 12 has the lower part 24 of each of its sides depressed as indicated in Figs. 7, 11 and 12, so that a shoulder 26 is formed between it and the upper portion 25, and the relation of the two die blocks of each pair is such that when they are moved together, the faces 24 and 25 of the block 12 cooperate with the faces 20 and 22 of the block 13 to form the box body side between them.

The under face of each of the inner die blocks 13 is formed with a projecting rib 26 adjacent its two outer edges and has the remainder of its under face depressed, so that after a box blank w^1 , Fig. 15, has been placed in the hollow of the lower die 15, the

depression of the upper die by means of a suitable press ram or plunger causes the inner die blocks 13 to enter said blank and engage the bottom thereof, at the same time that the flat lower faces of the die blocks 12 engage the flat upper face of the lower die 15. Thereafter the continued descent of the upper die causes the bottom w^3 of the blank to be compressed between the die block 17 and the die blocks 13, so that this is not only formed with a panel as shown in Fig. 16, but it is rigidly gripped and held flat, so that any warping or irregularities of its surface are effectually removed.

Prior to this final action, however, the inclined surfaces of the sleeve 3 and central member 9 have acted on the pairs of die blocks 13 and 12, so that while the upper portion w^5 of each side of the box blank is rigidly held between the die faces 25 and 20, the lower or main portion w^6 of each side of the blank is bulged or forced outwardly beyond the plane including the bottom edge of the side and said unaltered upper portion w^5 , as indicated at w^6 . As a result the finished box body has a neck formed by its portions w^5 , below which is a shoulder w^7 whose width is such that in the present instance (though not necessarily) the flange of the lid or cover fitted onto said neck has its outer surface substantially flush or in the same plane with the outer surface of the adjacent portion w^6 of said side, below which it is inclined inwardly to the bottom edge of said side. The raising of the upper die permits the springs 14 to separate the die blocks 12 and 13 of each pair so that the finished box body shown in Fig. 16 is released and may be removed.

I claim:

1. The combination of a head having undercut guideways; two sets of die blocks slidably mounted in said undercut guideways; a sleeve on the head formed to actuate one set of the die blocks; and a centrally placed member for actuating the die blocks of the inner set to cause them to co-act with the die blocks of the outer set in bulging the sides of a box body outwardly beyond an unaltered marginal strip extending around the top edge of said body.

2. The combination of a head; a block mounted to move vertically on the head having undercut guideways; two sets of coacting die blocks slidably mounted in said undercut guideways; a sleeve mounted on the head and having an inclined portion coacting with the die blocks of one set; a centrally placed pyramidal member positioned to cooperate with the die blocks of the inner set; and means for supporting a box body in position to be gripped between the die blocks of said two sets.

3. The combination of a supporting structure; a block yieldably mounted thereon and

formed with undercut guideways; two sets of cooperating die blocks having dovetail portions slidably mounted on said guideways; a sleeve carried by the supporting structure and formed with an inclined surface coacting with the die blocks of one set; a pyramidal structure mounted to expand the die blocks of the inner set, and means for supporting a box body.

10 4. The combination of a supporting head; an outer and an inner set of die blocks slidably supported by said head, said head and die blocks having coacting overhung and undercut portions whereby said blocks are
15 held to the head; means for simultaneously expanding the inner die blocks and contracting the outer die blocks, the inner die blocks being formed to project beyond the faces of the outer die blocks; and a structure for supporting a box body in position
20 to be acted on by the die blocks.

5. The combination of a supporting head; an outer and an inner set of die blocks slidably supported by said head; means for
25 simultaneously expanding the inner die blocks and contracting the outer die blocks,

the inner die blocks being formed to project beyond the faces of the outer die blocks; and a structure for supporting a box body in position to be acted on by the die blocks, the latter being formed to cooperate with the inner die blocks to form a panel in the bottom of the box body.

6. The combination of a supporting head; an outer and an inner set of die blocks slidably supported by said head; means for simultaneously expanding the inner die blocks and contracting the outer die blocks, the inner die blocks being formed to project beyond the faces of the outer die blocks; and
40 a structure for supporting a box body in position to be acted on by the die blocks, the latter being formed to cooperate with the inner die blocks to form a panel in the bottom of the box body at the same time that
45 the two sets of dies cooperate to bulge outwardly the sides of said body below an unaltered top marginal portion.

DAVID BOWERS,

*Executor of the last will and testament of
Charles T. Wootten, deceased.*