

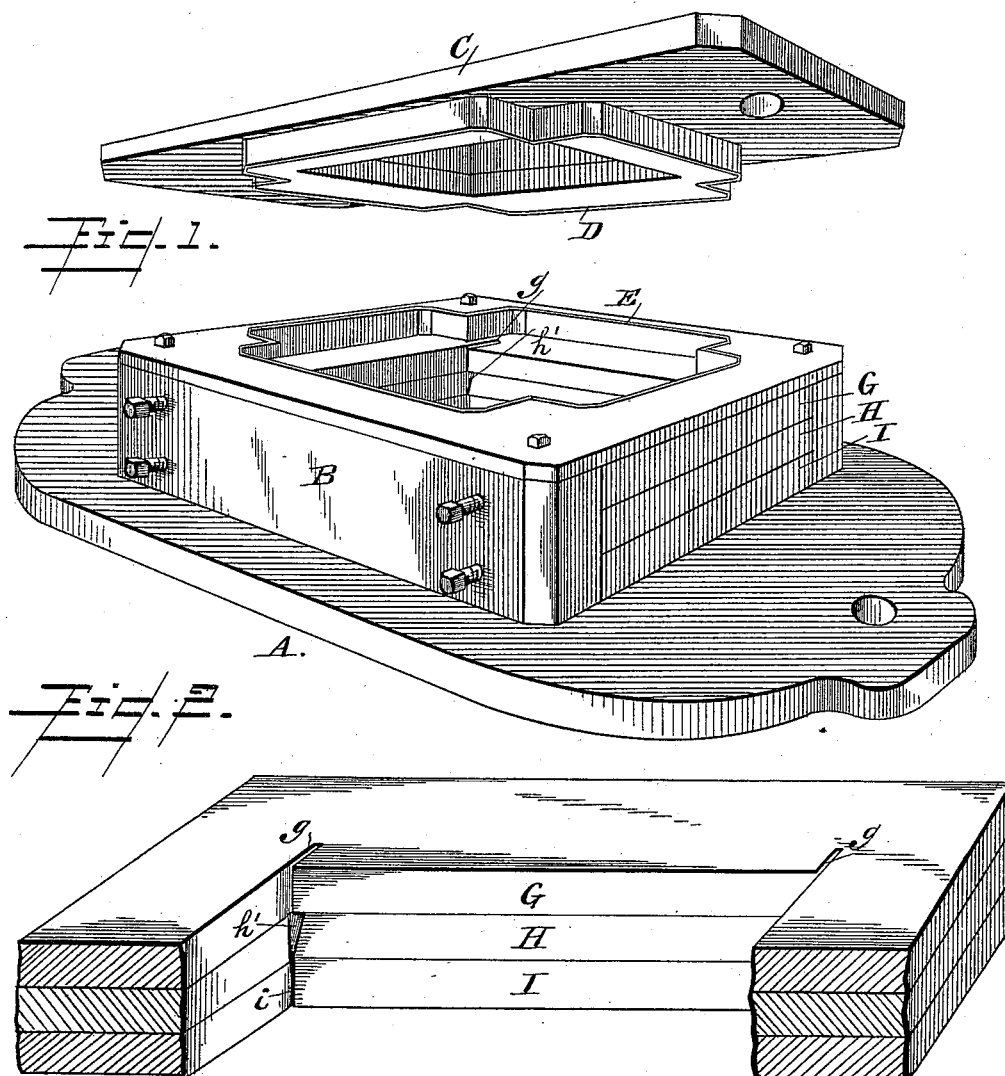
(No Model.)

2 Sheets—Sheet 1.

C. A. MORNINGSTAR,
SHEET METAL BOX AND DIE THEREFOR.

No. 420,912.

Patented Feb. 4, 1890.



Witnesses
Joseph Blackwood
W. J. Doolittle.

Inventor:
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by W. J. Doolittle
ATTORNEY.

(No Model.)

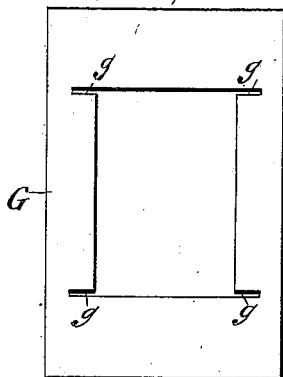
2 Sheets—Sheet 2.

C. A. MORNINGSTAR.
SHEET METAL BOX AND DIE THEREFOR.

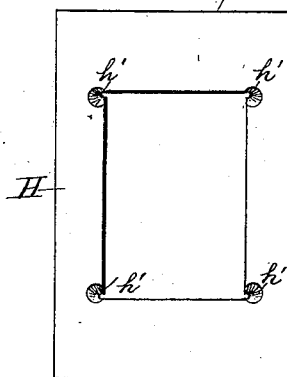
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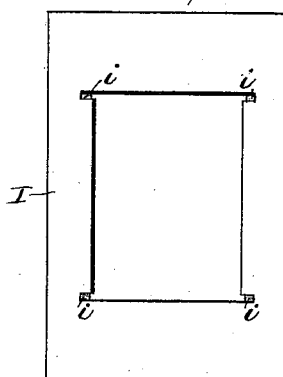
~~Fig. 3.~~



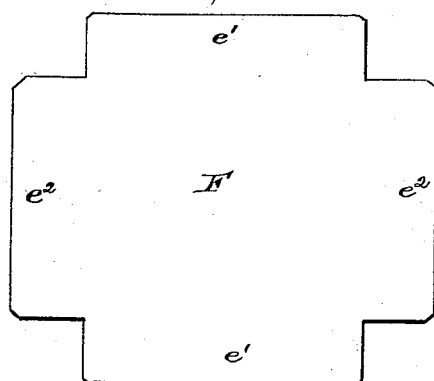
~~Fig. 4.~~



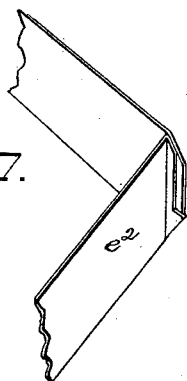
~~Fig. 5.~~



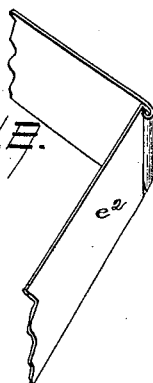
~~Fig. 6.~~



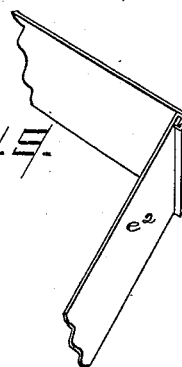
~~Fig. 7.~~



~~Fig. 8.~~



~~Fig. 9.~~



WITNESSES—

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UNITED STATES PATENT OFFICE.

CHARLES A. MORNINGSTAR, OF COLUMBUS, OHIO, ASSIGNOR TO WILLIAM A. GILL, OF SAME PLACE.

SHEET-METAL BOX AND DIE THEREFOR.

SPECIFICATION forming part of Letters Patent No. 420,912, dated February 4, 1890.

Application filed August 10, 1889. Serial No. 320,344. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. MORNINGSTAR, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Dies for Making Sheet-Metal Boxes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the manufacture of tin boxes and other tin or sheet-metal vessels; and it consists of dies for making the same and the vessel so made, as more fully hereinafter described and claimed; and its objects are to stamp up a box by a single stroke or operation of the die and to produce perfect seams therein without the use of solder.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective of the upper and lower parts of the die; Fig. 2, a transverse section of the lower or matrix part, and Figs. 3, 4, and 5 plans of the forming-plates. Fig. 6 is the form of blank first cut, and Figs. 7, 8, and 9 the successive appearance and condition of the box after it has passed through the successive forming-plates.

Referring to the drawings, A represents the stock, B the lower die, and C the upper die.

D is a cutting-ring in the upper die, and E a corresponding ring in the lower die, each formed to cut a blank F of the form shown in Fig. 6, having sides e' and ends e^2 . The blank is cut with square corners at the juncture of the sides and ends, and the ends e^2 have their corners clipped, as shown.

G, H, and I are the different forming-plates placed in the lower die, one above the other, through which the blank passes and forms the box and its locked-seam corners at its different stages. The top plate G is shown in detail in Fig. 3. It is provided at its corners with vertical slits g , formed at right angles with the length of the blank, and is designed after the blank is cut to first turn up and squeeze together the lower adjacent corners of the end and side pieces and to then form a vertical flange g^2 along the ends of

the sides, against which the ends e^2 are turned, as shown in Fig. 7.

H is the next plate from the top, having funnel-shaped recesses h' at the corners, by which the projecting ends of the box are folded over on the flanges g^2 of the sides at the second step of the operation. The ends thus folded on the flanges g^2 are designated e^3 .

I is the bottom plate designed to finish the operation, and is provided at its corners with oblong recesses i , through which the corners are forced, and when so forced the folded ends e^3 and the flanges g^2 are turned and pressed and folded tightly against each other and against the sides of the box, and thus an impermeable joint is formed. The cutting-ring and plates are secured in the lower die by means of screws, as shown. The central opening through the dies is made oblong and a corresponding form of punch is used, which may be operated by any well-known means. The box is struck up by one stroke of the punch, the finished box dropping out of the bottom of the lower die.

Such a box of the form shown is peculiarly adapted for use as a sedlitz-powder box; but of course its use is not confined to that purpose; nor are the dies and plates necessarily shaped to always form an oblong box, as shown.

It will be noticed that by the formation of the blank and the operation of the dies when the box is completed the side pieces have a flange at each end projecting at right angles with the body, and that end pieces overlap the sides and their flanges, are folded into said flanges, and both are pressed securely against the sides of the box, as shown in Fig. 8.

What I claim is—

1. The dies for forming a sheet-metal box having lock-seamed joints, consisting of an upper die provided with a cutting-ring to cut out the ends and sides of the blank, and a lower die provided with a corresponding ring, in combination with three plates in the lower die, the first provided with vertical corner slits, the second with funnel-shaped corner holes, and the third with oblong corner slots, whereby the said blank is formed and the ends and sides of said blank turned up, folded,

and pressed together at one operation of the punch, substantially as described.

2. A sheet-metal box formed of a single blank having side and end pieces, the ends
5 of the sides formed with a vertical flange turned at right angles with the body and the end pieces overlapping the ends of the side pieces and the flanges thereon and folded and pressed together and against the sides, where-

by an impermeable joint at the corners is so formed, substantially as described.

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

CHARLES A. MORNINGSTAR.

Witnesses:

H. H. WITTE,

G. G. GLEASON.