

(No Model.)

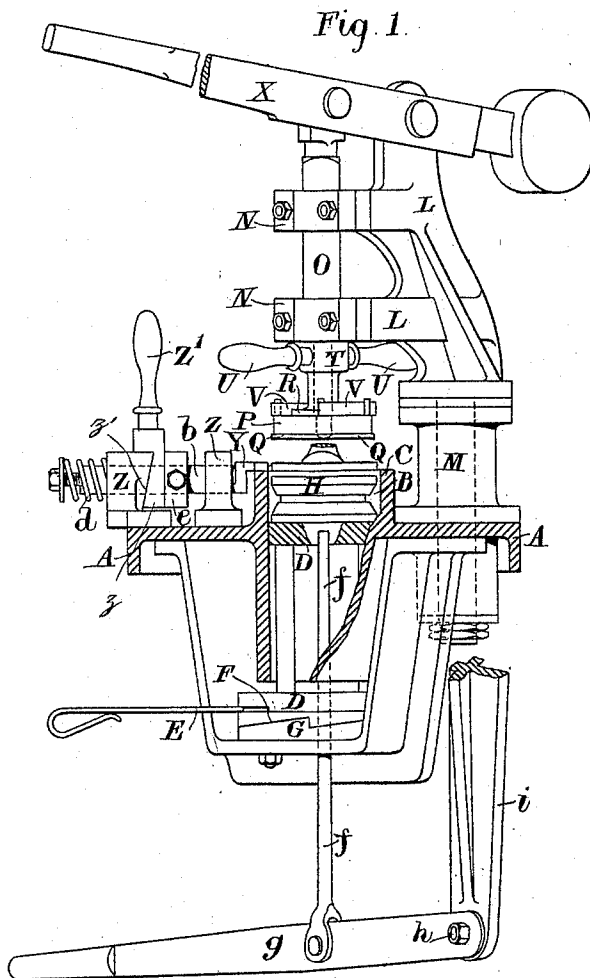
2 Sheets—Sheet 1.

F. J. KING.

APPARATUS FOR MAKING METAL BOXES.

No. 487,186.

Patented Nov. 29, 1892.



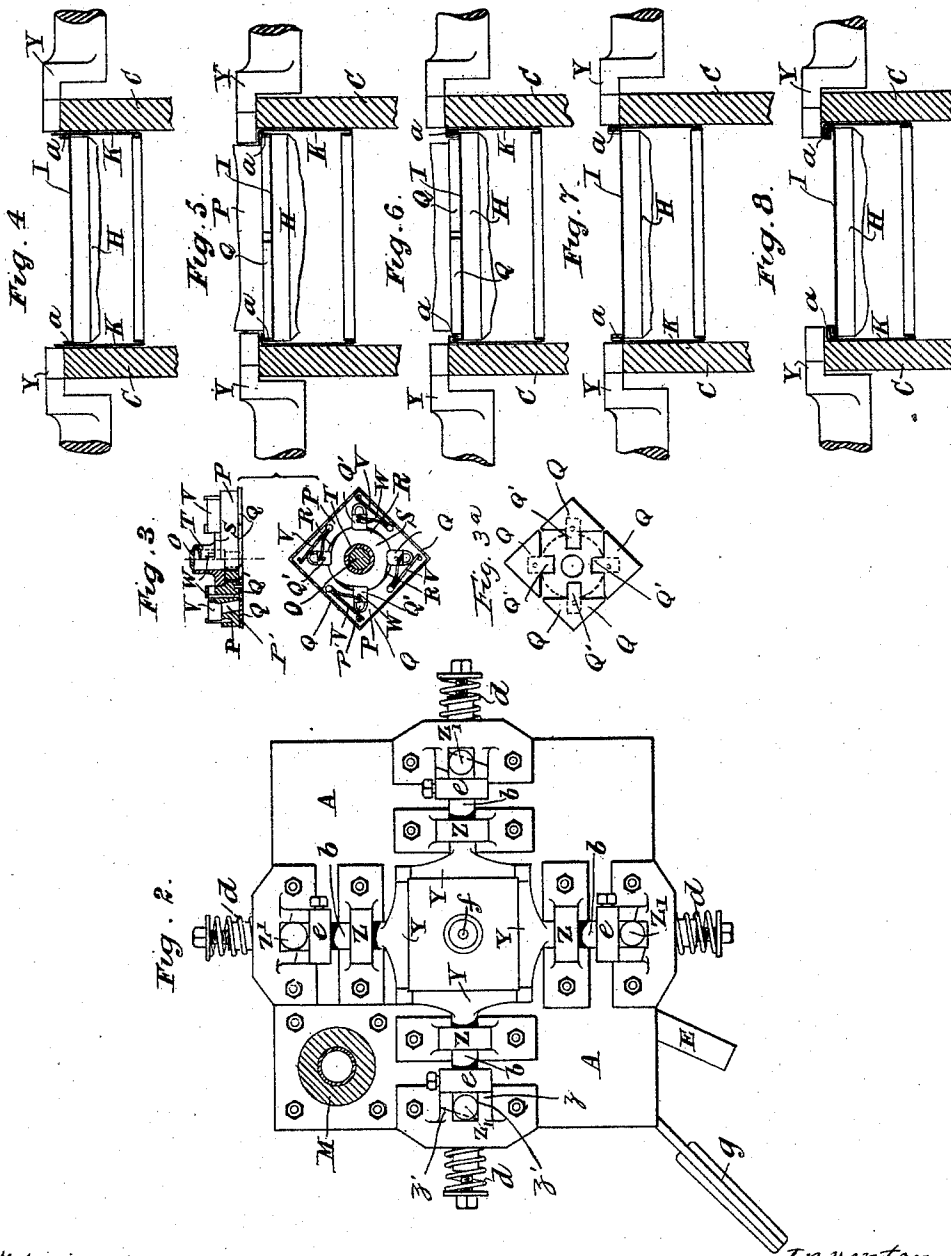
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# UNITED STATES PATENT OFFICE.

FREDERICK J. KING, OF LONDON, ENGLAND.

## APPARATUS FOR MAKING METAL BOXES.

SPECIFICATION forming part of Letters Patent No. 487,186, dated November 29, 1892.

Application filed January 26, 1892. Serial No. 419,347. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK JOHN KING, merchant, a subject of the Queen of Great Britain and Ireland, residing at 3 to 6 Camomile Street, in the city of London, England, have invented certain Improvements in Apparatus for Making Metal Boxes, of which the following is a specification.

My invention is designed more especially to provide convenient and efficient apparatus for fixing the end plate or bottoms in the bodies of metal boxes by folding together the edges of the plate or plates forming the body and of the said end plates or bottoms so as to securely connect them together without the necessity for riveting or soldering. It will be evident from the following description that a similar end plate may be attached to the sides in a similar way to form a top, provided there be an orifice in the top to allow of an internal anvil being withdrawn. The body portion—that is, the part forming the sides of the box—may be made from a single strip of metal bent to the required shape, and the edges may be connected together by any suitable means.

I will describe my present invention with reference to the accompanying drawings as applied to the fixing of a bottom plate to the sides, premising that I do not restrict myself to the precise details illustrated.

Figure 1 is an elevation, partly in section, of an apparatus constructed according to my invention. Fig. 2 is a plan of the table or lower part, showing the folding mechanism. Fig. 3 shows a vertical section and a plan of the plunger which holds the bottom in position while being fixed to the body of the box. Fig. 3<sup>a</sup> is a bottom view of the plunger, showing plates Q and blocks Q'; and Figs. 4, 5, 6, 7, and 8 are sectional views showing the several stages in the operation of fixing the bottom.

In the table A of the apparatus is provided a recess or opening B, corresponding in size and shape to the body of the box into which the bottom is to be fixed and surrounded by a rim C, forming a chamber to contain the body of the box. In this chamber is fitted to slide a plunger or movable bottom D, which is capable of being raised and lowered, as required by, means of the lever or handle E

connected to the rotating portion F of a turn-table on which the plunger D rests. The contiguous or meeting faces of the movable and stationary parts of the said turn-table are provided with inclined surfaces circularly disposed, so that by turning the movable portion in one direction it will be caused to ascend the inclined surfaces on the fixed or stationary part G, whereby the plunger D may be raised to the required extent and lowered again by rotating the part F in the reverse direction. The body of the box to receive the bottom is placed in the recess or chamber B, the lower edge of the body then resting on the movable bottom or plunger D, which is arranged at such a height in the chamber B that the upper edge of the said body projects above the rim C to an extent required to make the first fold in the process of securing the bottom. Inside the body is placed an easily-fitting anvil H, which may consist of a solid block, as shown, or it may be built up of parts. This anvil rests on the movable bottom or plunger D and is of such a depth or thickness as to leave projecting above its upper end sufficient of the upper part of the body of the box to secure the bottom of the box. The bottom to be fixed to the body consists of a plate I of the required size, having its edges *a* turned up to a right angle, which may be effected by any suitable means, so as to form a tray or dish, as shown in Fig. 4, which plate, with its upturned edges *a* uppermost, is placed on the top surface of the anvil H within the body of the box K, the depth of the upturned edges *a* of the plate I being such as to extend, say, about half-way up the portions of the sides of the body which project above the top surface or edge of the anvil.

On the upper surface of the table A is arranged an overhanging bracket L, which may, if desired, be fixed rigidly to the table, or, as shown, it may be fitted to turn in a socket M into and out of operating position to facilitate the placing of the body and bottom of the box in position in the chamber B and for removing the box therefrom when the bottom is fixed.

Fitted to slide in bearings N in the bracket L is a rod O, carrying at its lower end the plunger P, provided with sliding pieces or plates Q, (see Figs. 1, 3, 5, and 6,) which are

capable of being projected when required beyond the edges of the plunger-body by a cam-surface or cam-surfaces R, formed on a plate S, carried by a sleeve T, fitted to turn on the rod O and provided with handles U, by which to turn the sleeve when required. The sliding pieces Q have formed with or secured to them the blocks Q', which project upward through slots P' in the plunger. These are kept in contact with the cam-surfaces by springs V, secured to the body of the plunger and acting on pins or projections W on the blocks Q' of the sliding pieces or plate Q. The plunger P is raised and lowered by means of a counterbalanced lever X, centered to the upper end of the bracket L. The body of the box and the tray to form the bottom thereof being placed in position in the chamber B, as described, the plunger P is caused to descend onto the plate I, after which the sliding plates or pieces Q are projected by turning the cam-surfaces by means of the handles U. The plates Q when projected press against the upturned edges *a* of the plate I, so as to hold it firmly in position, and the thickness of the plates Q is such that their upper surfaces are about level with the top edge of the rim C of the chamber B. While the parts are in this position plates Y, fitted to slide in guides Z on the table A of the apparatus, are moved forward by means of levers Z', mounted so as to turn on the stems *b* of the plates Y. The boss *z* of each of these levers is provided on one side with a circularly-disposed cam-surface *z'*, held in contact with a corresponding cam-surface on the contiguous guide Z by a spring *d*, while the opposite side of the boss of the lever is plane and bears against a collar *e*, adjustably fixed on the stem *b*, so that when the lever is turned on the stem it will be caused by the cam-surfaces to press against the collar *e* and force the plate Y forward against the resisting power of the spring *d* and press the edge of the box-body, which projects above the surface of the rim C, to a right angle over the upturned edge *a* on the plate I, as shown in Fig. 5.

The projecting edges of two sides of the body may be turned over at one time by the operator turning two opposite levers Z'. The levers Z' and plates Y are returned to the normal positions by the springs *d* when the levers are released. When the projecting edges of the four sides of the body have been turned over, as shown in Fig. 5, and the sliding plates Y withdrawn, the sliding plates or pieces Q are also retracted or drawn into the body of the plunger by means of the handles U and the plunger raised by the lever X out of contact with the plate I. The sliding plates Q are then again caused to protrude and the plunger P brought down so that the protruding plates Q then come onto the turned-over upper edges of the body of the box, causing the said edges to be further folded into the position shown in Fig. 6, so as to inclose the turned-up edges *a* of the bottom plate I. The

plunger P is then again raised and the bottom plunger or movable bottom D of the chamber B, on which the anvil H and body of the box rests, is also raised, so as to bring the plate I of the box about level with or slightly below the edge of the rim C, as shown in Fig. 7, the edges of the body of the box which project above the bottom plate I projecting then above the rim C of the chamber. The sliding plates Y, which before had turned the upper edges of the body at right angles, are now moved forward, (preferably two opposite ones at a time,) as before, so as to fold the projecting edges of the body, inclosing the upturned edges *a* of the plate I, down onto the surfaces of the plate I, as shown in Fig. 8, and thereby fix the bottom in the body. The sliding plates Y are then withdrawn and the bracket L turned in its socket M, so as to move the plunger P from over the chamber B, after which the anvil H, with the box thereon, is forced from the recess or chamber B by means of a rod *f*, passing from below through a hole in the turntable and the movable bottom D and bearing against the bottom of the anvil H. This rod may be raised by a treadle, if desired, or, as shown in the drawings, by a lever *g*, centered at *h* to a bracket *i*, projecting from the under side of the table A, to which lever the rod *f* is connected, so that by raising this lever the anvil, with the box thereon, may be raised sufficiently from the recess to enable the operator to remove it by hand. The finished box having been removed from the anvil, another box-body is placed in the recess or chamber B, the anvil placed in the body, and a plate or tray to be secured therein being placed on the anvil the operations hereinbefore described are repeated. If the bottom plate only is fixed in the way described, the lids for the boxes may consist of loose trays similar to the bottoms I before being fixed, or, if desired, the lids may be hinged to the body in any convenient manner.

I claim—

1. In apparatus for the purpose described, a recess or chamber having a movable bottom to contain and support the body of the box while fixing the end plate thereto, an anvil or frame to support the said plate while being fixed, means for raising the movable bottom, as required, and sliding plates for folding or bending over the edges of the body of the box and the plate to be attached thereto, the whole being arranged substantially as and for the purpose hereinbefore described.

2. In apparatus for the purpose described, a recess or chamber having a movable bottom to contain and support the body of the box while fixing the end plate thereto, an anvil or frame to support the said plate while being fixed, means for raising the box in the recess or chamber, as required, a block or plunger for holding the said end plate in position on the anvil or frame and provided with sliding pieces capable of being protruded and with-

drawn, and sliding plates for folding or bending over the edges of the body of the box and of the end plate, the whole being arranged substantially as and for the purpose herein-  
5 before described.

3. In an apparatus for making boxes, the combination of a chamber in which is supported the body of the box while the end plate is being fixed therein, an anvil or support for  
10 the said plate while it is being fixed in place, means for moving the anvil, a plunger for holding the said end plate in position on the

anvil, the sliding plates Q, carried by the said plunger, the cams R, which engage with the plates and move them, and means for moving 15 the cams, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FREDK. J. KING.

Witnesses:

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*Both of 3 Camomile St., E. C.*