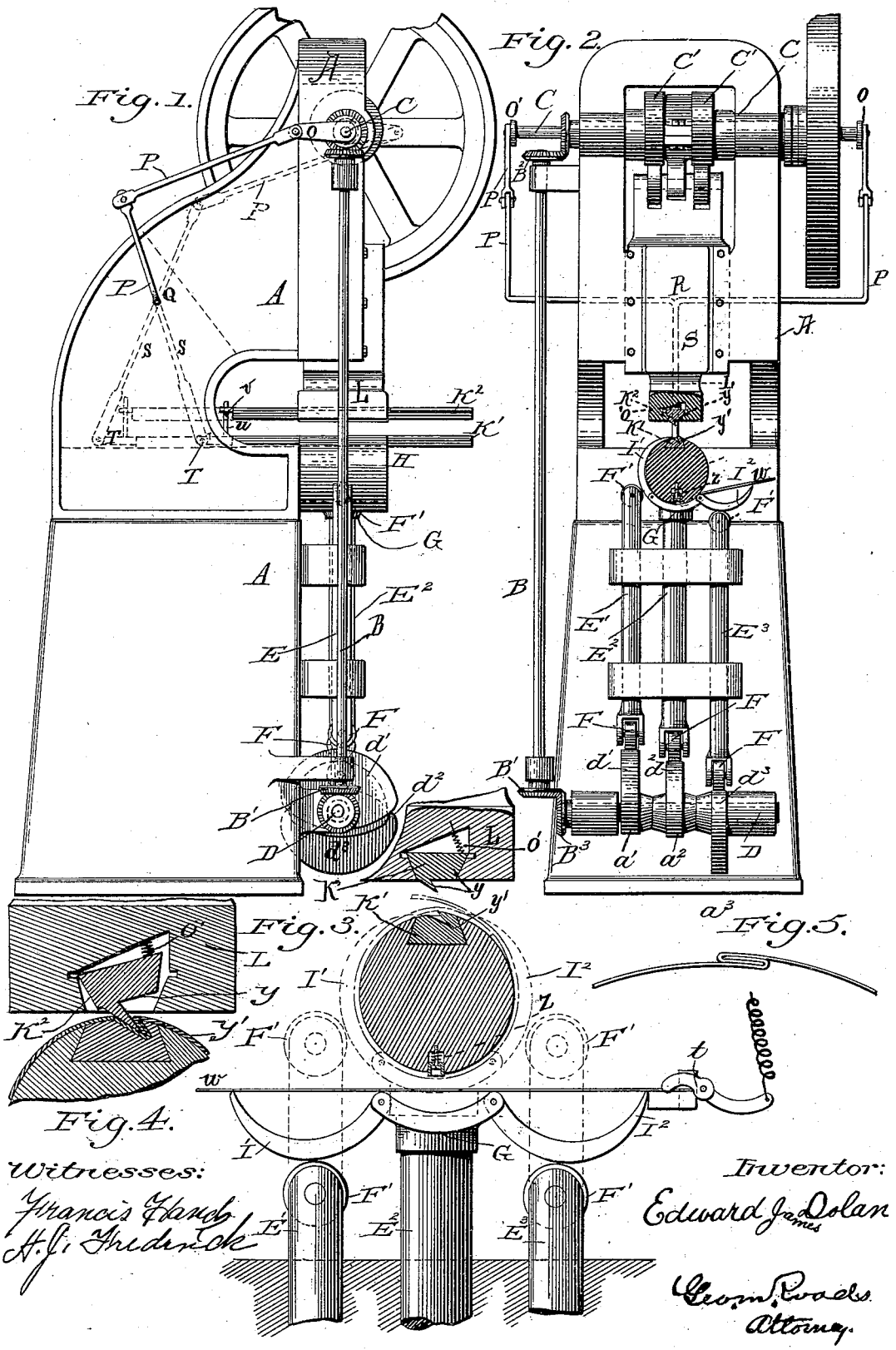
(No Model.)

E. J. DOLAN.

DEVICE FOR FORMING AND SEAMING TIN CAN BODIES.

No. 345,284. Patented July 13, 1886.



Witnesses:
Francis Hand
H. C. Fredericks

Inventor:
Edward James Dolan
Geo. S. Woods
Attorney.

UNITED STATES PATENT OFFICE.

EDWARD JAMES DOLAN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO WILLIAM HACKER, TRUSTEE, OF SAME PLACE.

DEVICE FOR FORMING AND SEAMING TIN-CAN BODIES.

SPECIFICATION forming part of Letters Patent No. 345,284, dated July 13, 1886.

Application filed November 9, 1885. Serial No. 182,203. (No model.)

To all whom it may concern:

Be it known that I, EDWARD JAMES DOLAN, a citizen of the United States, residing at Philadelphia, Pennsylvania, have invented a new and useful Device for Forming, Edging, Seaming, and Delivering Tin-Can Bodies, of which the following is a specification.

My invention relates to a device for making tin-can bodies of a uniform size.

My object is to quickly and economically form, edge, seam, and deliver from the machine tin-can bodies of a uniform size, instead of forming, edging, and seaming such bodies by separate machines. My invention does away with such machines, and also the necessity of the operator holding the incomplete body on the cylinder by hand during the seaming process, and that of removing by hand the tin-can body when formed, which process is a much slower and less accurate method. I attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view of the machine. Fig. 2 is a front view of the entire machine. Fig. 3 is a front view of the can-forming device, shown detached from the machine, with tin sheet in position ready to be operated upon, similar letters throughout the figures designating corresponding parts.

My invention consists, principally, of a fixed cylinder or former, two movable horizontal bars with die and follower, a plunger, an upright pushing-bar with end or shoulder, said shoulder having a wing on each side, two other pushing-rods having rollers at both ends, and gearing for the several parts.

A is the frame of the machine.

B is a vertical shaft with beveled gear-wheels B' B^2 on the ends of shaft B.

D is a horizontal shaft with cams d' d^2 d^3. Shaft D is operated by gear-wheels B' and B^3 on vertical shaft B.

E' E^2 E^3 are upright pushing-bars operated by cams d' d^2 d^3 on horizontal shaft D, and, except E^2, are supplied with friction-rollers at each end, F F F and F' F'. Bar E^2 has on its upper end a convex shoulder, G, to accommodate part of the circumference of cylinder H, when bar E^2 is forced to its highest point, and has adjusted at its lower end a friction-roller, F. Shoulder G has on each side a hinged jaw or wing, I' and I^2, each having the contour of the parts of cylinder H, which each embraces when forced upward by bars E' and E^3.

K' and K^2 are metal bars, which move horizontally forward and backward—K' through the upper part of cylinder H and K^2 through the lower part of plunger L—by being operated upon from either or both (shown in Figs. 1 and 2 as operated from both) ends of main shaft C by means of crank O and jointed connecting-rods P P. Connecting-rods P P are bent at right angles, as shown in Fig. 2, and pass through the frame of the machine, as at Q, and are joined at a point in the center back of the machine, as indicated by dotted lines at R, and, continuing as a single rod, S, is connected to the bar K' at T. (The bars K' and K^2 can be operated by different gearing, or even by hand; but the method shown is preferable.) K' has a bar or pin, U, which, passing through the end V of the bar K^2, enables rod S to convey motion horizontally to bar K^2 and at the same time does not interfere with the motion of the plunger L in forcing K^2 down upon K'.

W in Fig. 3 is a blank tin sheet in position and ready for operation.

X is a common lever with spring attachment to hold tin sheet W in position until shoulder G begins to move upward, when the operator by pressing on the arm of the lever releases said sheet to be carried forward finally by wing I^2.

Y is the oblique follower-die on and a part of bar K^2.

Y' is the oblique die on and a part of bar K', to accommodate follower Y. An opening in shape as shown in the drawings is provided in the plunger, through which horizontally at certain periods reciprocates bar K^2. When said bar is thus in position, a space triangular in form between the upper side of the said bar and the said plunger remains, in which space is adjusted a spring, O'. The object of said spring is as follows: Plunger L in descending forces follower Y perpendicularly upon die Y', then, owing to the continued force of the plunger and the resistance from that portion of the die with which the follower comes in contact, the force is thrown back upon and compresses said spring, thus allowing said bar to turn upward slightly,

causing the follower to take an oblique course and fit into the die. After the follower is withdrawn the spring causes the said bar to assume its normal position. (I may, if necessary, adjust a spring of other form from the outside of the plunger, instead of the inside, and thus bear upon bar K^2 and effect the same result.)

Z is a compensating spring adjusted in the cylinder to allow the tin sheet to be slightly compressed, so as to give room for the drawing of the tin in the crimping process.

C′ C′ are cams adjusted on main shaft C.

The operation of the device is as follows: The blank tin sheet, cut to the proper size, is placed between the cylinder H and the convex end or shoulder of the pushing-bar E^2, and is held in place by lever X. The machine is then started by the usual means. Owing to the adjustment of the cams d' d^2 d^3, pushing-bar E^2 first moves up and forces the middle portion of the tin sheet tight on cylinder H. Bar E′, meanwhile following, forces wing I′ to embrace a portion of the cylinder, as shown in Fig. 2, carrying with it part of tin sheet immediately above it. Bar E^3, then also on its way up, likewise forces wing I^2 to embrace the remaining portion of the cylinder, carrying with it part of tin sheet just above the said wing I^2, completing the form of the can-body. The sheet of tin must be long enough, that when ready for seaming or pressing together the ends thereof will extend somewhat over and beyond die Y′, as shown by dotted lines in Fig. 3, that there be sufficient material to form the edge or crimp. The can-body is then ready for edging. This is done as follows, viz: Immediately after wings I′ and I^2 have fallen away from the cylinder, owing to the continued revolution of shaft D, which returns bars E′ E^2 E^3 to their lowest points, the can is edged or seamed by one stroke of the plunger L, which, moving down, forces follower Y upon the ends of the tin sheet and carries them into the die Y′, the shape of which they then assume. The oblique course is given to the follower by means of the springs already herein described.

The seaming is done as follows: The bars K′ and K^2 are of metal, movable backward and forward, as described hereinbefore, and present a uniform solid surface, excepting in K^2 for the length of the follower and in K′ for the length of the die, the edge of which die protrudes slightly to make a better crimp, and to throw the can off the cylinder, as hereinafter described. The main shaft revolving, the pointed connecting-rods P P draw back bars K′ and K^2 simultaneously until the follower in bar K^2 is back or clear of the plunger and the die in K′ is back or clear of the cylinder. This leaves the can-body still embracing the cylinder, and with the solid portion of bar K′ underneath the crimp of the can-body, and leaves the plunger likewise with the solid portion of bar K^2 in the place of that occupied by that portion forming the follower. The plunger, by means of the properly-adjusted cams on the main shaft, then descends on the edge or crimp and seams or presses it tight, and the main shaft, continuing to revolve, returns bars K′ and K^2 to their first position. In doing this the protruding edge of die Y′ strikes the edge of the can-body and delivers it over the outer ends of bars K′ and K^2 from the machine.

This invention is an improvement on patent granted me October 9, 1883, and No. 286,283. The details of the gearing of the machine and the manner of communicating motive power is disclaimed, particular attention being directed to the mechanism of the can-body cylinder, the bars E′ E^2 E^3, and the horizontal bars K′ and K^2, with all of their parts and their manner of use.

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

1. In a device for rapidly forming and seaming tin-can bodies, the combination of two horizontal reciprocatory bars having an oblique crimping-die and follower, respectively, each bar having portions of its surface smooth, one immediately above the other, the upper bar to pass at timed periods to and fro through and supported by the lower portion of a plunger, and to be carried up and down by the plunger and guided by an upright pin on the lower bar, the lower bar to pass horizontally through and be supported by the upper part of a cylinder, with said cylinder and said plunger, and mechanism for operating the same, substantially as shown and described.

2. In a device for forming and seaming uniform can-bodies, the combination of a spring located in a recess in a plunger and bearing from a plunger to the upper one of two horizontal reciprocatory bars with crimping-die and follower, respectively, passing horizontally through and supported by a plunger and a cylinder, respectively, with said bar and plunger, substantially as shown and described.

3. In a device for forming and seaming uniform can-bodies, the combination of two horizontal reciprocatory bars with crimping-die and follower, respectively, passing horizontally through and supported by a plunger and a cylinder, respectively, with said cylinder and a vertically-reciprocating bar having a shoulder with a wing on each side, substantially as shown and described.

4. In a device for making uniform bodies of suitable material, the combination of reciprocatory bars E′ and E^3 with wings I′ and I^2, substantially as shown and described.

In witness that I claim the same I have hereunto set my hand this 31st day of October, A. D. 1885.

EDWARD JAMES DOLAN.

Witnesses:
WALTER F. WARRINER,
JOSEPH FRANKISH, Jr.