(No Model.)

J. ZIMMERMAN & J. K. UNDERDOWN.

PUNCH FOR FORMING TONGUES IN BLANKS FOR KEY OPENING CANS.

No. 504,187. Patented Aug. 29, 1893.

Fig. 6.

Fig. 1.

Fig. 7.

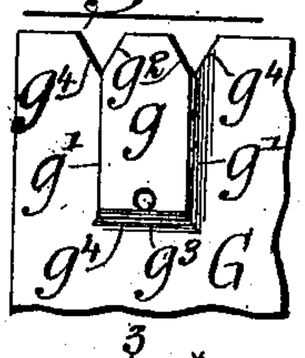


Fig. 2.

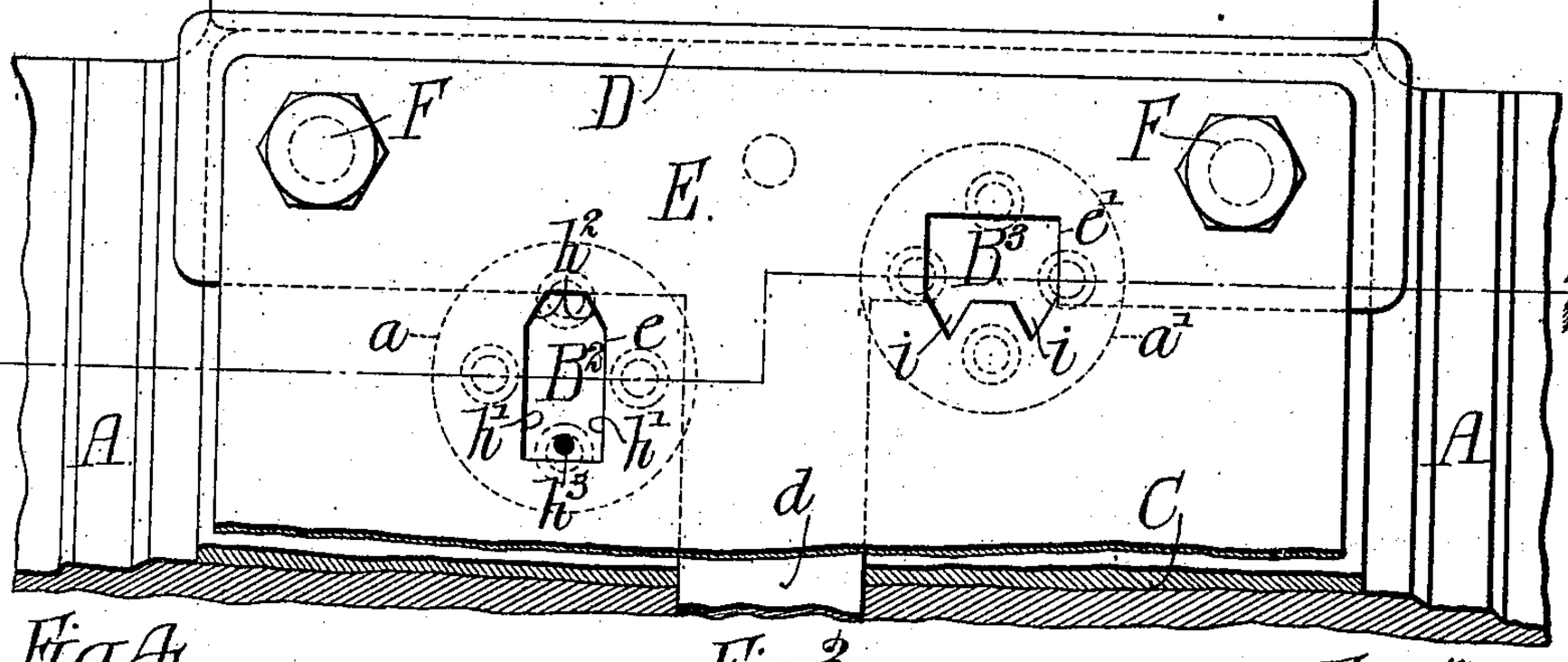


Fig. 4.

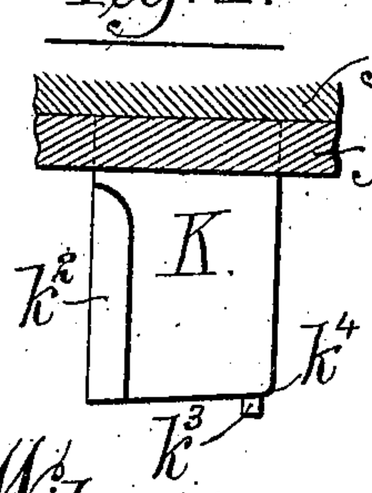


Fig. 3.

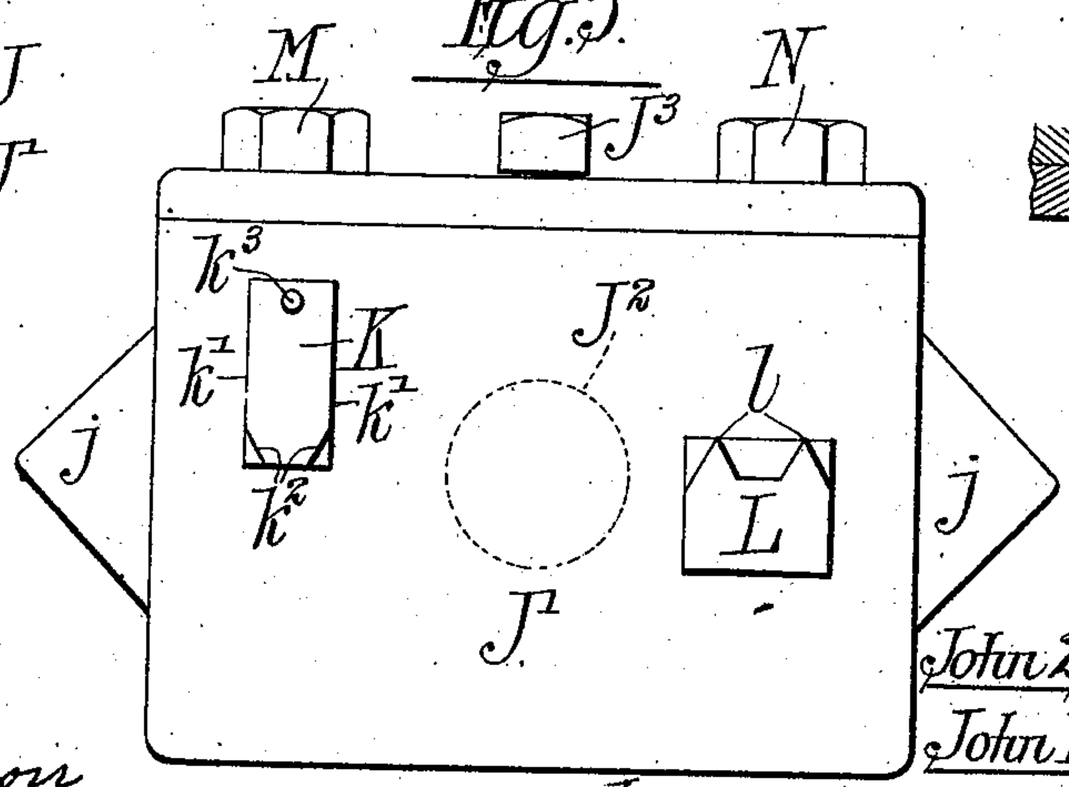
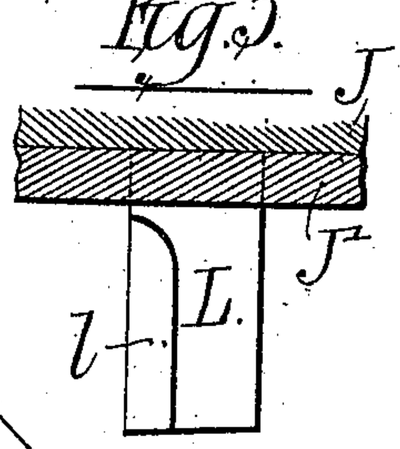


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN ZIMMERMAN AND JOHN K. UNDERDOWN, OF CHICAGO, ILLINOIS, ASSIGNORS T THE NATIONAL KEY-OPENING CAN COMPANY, OF SAME PLACE.

PUNCH FOR FORMING TONGUES IN BLANKS FOR KEY-OPENING CANS.

SPECIFICATION forming part of Letters Patent No. 504,187, dated August 29, 1893.

Application filed December 16, 1892. Serial No. 455,354. (No model.)

To all whom it may concern:

Be it known that we, JOHN ZIMMERMAN and JOHN K. UNDERDOWN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Punches for Forming Tongues in Blanks for Key-Opening Cans; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Our invention relates to machines for cutting out the sheet metal blanks used in making what are known as key-opening cans, and more particularly for making that type or kind of key-opening cans which is embraced in Letters Patent No. 486,522, granted to John Zimmerman, one of the applicants, November 22, 1892, and in Letters Patent No. 486,523, also granted to the said Zimmerman on the same date.

The objects of our invention are to produce mechanism by means of which the free lip or tongue of the blank shall be rapidly and economically cut out of the blank, perforated and raised from the blank, and the operation of which shall be such as to enable double quantities of the stock to be simultaneously operated upon; thereby enlarging the productive capacity of the mechanism and still further enhancing the economy of production.

To the above purposes our invention consists in certain peculiar and novel features of construction and arrangement, as hereinafter described and claimed.

In order that our invention may be fully understood we will proceed to describe it with reference to the accompanying drawings in which—

Figure 1 is a vertical longitudinal section of the bed-plate of the machine and its immediate operative attachments, and also a front elevation, partly broken away, of the reciprocatory head of the machine and its cutting and puncturing attachments; the section being taken on the irregular line 1—1 of Fig. 2 and the direction of view being rearward, as indicated by the arrows applied to said line. Fig. 2 is a plan view of the bed-plate of the machine; the bed-plate being partly broken away, and the direction of view being downward, as indicated by the arrows 2 applied to the horizontal broken line in Fig. 1. Fig. 3 is an under side plan view of the reciprocatory head of the machine and its attachments; the direction of view being upward, as indicated by the arrows 3 applied to the horizontal broken line in Fig. 1. Fig. 4 is a transverse vertical section of the reciprocatory head, taken on the line 4—4 of Fig. 1; the direction of view being to the right, as indicated by the arrows applied to said line. Fig. 5 is a transverse vertical section of the reciprocatory head, taken on the line 5—5 of Fig. 1; the direction of view being to the left, as indicated by the arrows applied to said line. Fig. 6 is a plan view of a fragment of the blank as it appears after treatment by the die at the left hand end of the reciprocatory head in Fig. 1. Fig. 7 is a plan view of a fragment of the blank as it appears after treatment by the die at the right hand end of the reciprocatory head in Fig. 1.

In the class of hermetically sealed cans, to the manufacture of which our present invention relates, the body sheets of the cans are formed with a free lip or tongue which is a prolongation of a detachable strip of the body sheet or blank, this lip or tongue lapping outside of the opposite edge of the body strip or blank and being soldered thereto, when the can is formed up, and said lip or tongue being adapted for seizure by an implement or "key," when the can is to be opened so as to permit the severance of the detachable strip from the body sheet of the can. For a more perfect understanding of these structural features of the can we again refer to the said prior patents numbered 486,522 and 486,523 previously mentioned.

In the accompanying drawings, A designates the bed-plate of the machine, this plate occupying a horizontal position and being supported by any suitable frame-work. In this bed-plate are formed two sockets or cavities a and a' which are preferably of circular form and which are located one beside the other with a suitable distance between them. Within these two sockets are placed the two blocks B and B′, these blocks being fitted to be supported laterally, but adapted to be de-

pressed in the sockets. A suitable number of spiral springs *b* placed in the cavities *a a'* below the blocks, afford the latter suitable yielding support. Upon the upper side of the bed-plate A is placed a horizontal top-plate C which rests directly upon the bed-plate A and which overlies the cavities *a a'*. Through this top-plate are formed two openings *c* and *c'* which respectively overlie the cavities *a* and *a'* of the bed-plate A and into which protrude extensions B^2 B^3 respectively of the blocks B B'; these openings conforming in shape to the cavities *a a'* of the bed-plate. Above the top-plate C is placed a horizontal spacing-plate D which is shown as of approximately T-form, the rear or body portion of the plate extending longitudinally of the rear part of the bed-plate A, and an extension *d* protruding forward from the middle of the spacing-plate, at right angles thereto, so as to lie between the cavities *a* and *a'* of the bed-plate. Upon the spacing-plate D is laid a face-plate E which may be of similar shape to that of the bed-plate A, and which, owing to the presence of the spacing-plate D, is separated from the bed-plate A by a horizontal space which is centrally divided by the extension *d*. This face plate E is formed with two apertures *e* and *e'* which directly overlie the openings *c* and *c'* respectively of the top-plate C and also the cavities or sockets *a* and *a'* respectively of the bed-plate A, and which conform in shape to said openings and cavities. The top-plate C and face-plate E are retained in position upon the bed-plate A by any suitable number of bolts F having the usual retaining nuts *f*. The springs *b* normally retain the blocks B B' in the elevated position with the upper ends of the blocks pressed against the under surface of the top-plate C and with their extensions or bosses B^2 B^3 within the openings *c c'* of said top-plate. These bosses B^2 B^3 constitute dies to act in conjunction with plungers carried by the reciprocatory head of the machine, as hereinafter described. The left hand die B^2 operates, in conjunction with the left hand plunger, to perforate the blank, to cut the slits at the sides of the tongue, and to raise the latter out of the opening, the product being shown in Fig. 6. In this figure G designates a fragment of the blank sheet for a can body and *g* the tongue. The tongue *g* lies within the body sheet at one edge thereof and is separated from the body sheet by two parallel slits or cuts *g'* the outer ends of which are convergent, as at g^2, wherefore the boss B^2 is formed with two parallel sides *h'* to make the slits *g'* and two convergent sides h^2 to make the convergent portions g^2 of the slits. A hole g^3 is required in the tongue *g* near its base, and to form said hole the boss B^2 is provided with a vertical cavity h^3 to receive a corresponding punch on the plunger. Owing to the presence of the parallel sides *h'* of the boss B^2, said boss is of elongated form and is also contracted at the opposite end from that end near which the cavity h^3 is formed, and the opening *c* and aperture *e* of the top-plate C and face-plate E respectively are of corresponding form to that of the boss B^2. In order to render the lip or tongue perfectly free at its outer end, the outer ends of the slits *g'* are subsequently cut away so as to form outwardly divergent margins g^4, and this is accomplished by the die B^3. For this purpose the die B^3 is formed at its front with two forwardly extending triangular or wedge-shaped projections *i* the outer inclined sides or edges of which merge with the outer sides of the boss or die and which serve, in conjunction with the right hand plunger, to make the oblique cuts g^4; thus removing small triangular or wedge-shaped pieces from the stock or body sheet.

J designates a suitable head or carrier which is mounted above the bed-plate and cap-plate and which is intended to reciprocate vertically above said plate; triangular projections *j* being shown at the ends of the head or carrier, to work in similarly shaped guide grooves in a framing of any suitable construction. From the under side of this head or carrier J protrudes downwardly two plungers K and L which are shown as detachably secured to the head or carrier J by set screws M and N respectively, but which may be connected to said head in any preferred manner. The plunger K is centered directly over the cavity *a* while the plunger L is centered directly over the cavity *a'*; the arrangement being such that the plunger K operates in conjunction with the die or boss B^2, while the plunger L operates in conjunction with the die or boss B^3. The plungers K and L are shown as connected together by a coupling-plate J' by which said plungers are steadily held in their proper working position; said coupling-plate being formed with an upward extension J^2 entering the head J and detachably held therein by a set-screw J^3. The lower end or face of the plunger K is inclined upwardly and forwardly and the two edges or sides *k'* of the plunger are formed parallel with each other so as, in conjunction with the straight parallel edges or sides *h'* of the die B^2, to form the parallel cuts *g'* of the blank. The rear corners of this plunger are beveled off or inclined, as at k^2, so as, in conjunction with the inclined edges or sides h^2 of the die B^2, to form the oblique cuts g^2 of the blank. A stud k^3 extends downwardly from the front part of the face of the plungers so as to form the hole g^3 in the lip or tongue *g* (this stud entering the cavity k^3 of the die B^2) and the front margin k^4 of the face of the plunger is rounded upward so as to bend the tongue upward, as at g^4, at the point of union of the tongue with the body sheet; this upward springing of the tongue serving to carry it out of the plane of the body sheet, so that it shall properly lap over the adjacent opposite edge of said body sheet. The front edge of the plunger L is formed with two triangular forward projections *l* the outer margins or

edges of which act in conjunction with the outer margins or edges of the projections *i* of the die B^3, to form the divergent cuts g^4 of the blank.

In the operation of the machine a body sheet is first inserted between the top-plate C and face-plate E so as to overlie the cavity *a* and, as the head J descends, the plunger K makes the parallel cuts *g'* and oblique cuts g^2 and also punches the hole g^3, and bends the tongue, as at g^4. The body sheet is now withdrawn from the machine and reversed, so that its under surface is presented uppermost, and is thus inserted between the top-plate C and face-plate E so as to overlie the cavity *a'*. Meantime a fresh body sheet has been inserted between the top-plate and face-plate, and as the head J again descends, the plunger K operates as before, upon the fresh body sheet, while the plunger L is making the divergent cuts g^4 in the blank which had been previously operated upon by the plunger J and die B^2. Thus it will be seen that we have produced a mechanism for forming key-opening can blanks which is simple in its construction and direct and positive in its operation, and by means of which double quantities of stock can be simultaneously handled.

We claim as our invention—

1. A machine for forming key-opening-can blanks, comprising a pair of depressible dies formed respectively to accord with the shape of the tongue or lip of the body sheet, and also to the divergent clearing-cuts of said body sheet, and a pair of reciprocatory plungers conforming each in shape to the shape of one of the dies, substantially as set forth.

2. A machine for forming key-opening-can blanks, comprising a pair of dies one of which is formed to accord with the shape of the lip or tongue of the body sheet, and also recessed for the perforation of said lip or tongue, and the other of which is formed to accord with the divergent clearing-cuts of the body sheet, and a pair of reciprocatory plungers one of which conforms in shape to the first named die and is provided with a projection to enter the recess of the die, and the other of which plungers is formed to accord with the shape of the second die, substantially as set forth.

3. A machine for forming key-opening-can blanks, comprising a pair of dies one of which is formed to accord with the shape of the lip or tongue of the body sheet, and the other of which is formed to accord with the divergent clearing-cuts of the body sheet, and a pair of reciprocatory plungers one of which conforms in shape to the shape of the first named die and has a beveled portion to raise the lip or tongue, and the other plunger of which is formed to accord with the shape of the second named die, substantially as set forth.

4. A machine for forming key-opening-can blanks, comprising a pair of depressible dies formed respectively to accord with the shape of the tongue or lip of the body sheet, and also to the divergent clearing-cuts of said body sheet, a suitably apertured and recessed framing for said dies, and a pair of reciprocatory plungers each according in shape to the shape of one of the dies, substantially as set forth.

5. A machine for forming key-opening-can blanks, comprising a pair of depressible dies formed respectively to accord with the shape of the lip or tongue of the blank, and with the clearing-cuts thereof, and a pair of reciprocatory and simultaneously movable plungers according each in shape to the shape of one of the dies, substantially as set forth.

6. A machine for forming key-opening-can blanks, comprising a bed-plate having a pair of recesses or cavities to receive the forming-dies, a top-plate overlying the bed-plate and apertured coincidently with said recesses or cavities, a face-plate overlying the top-plate and apertured coincidently with said top-plate, and a spacing-plate interposed between the top-plate and the face-plate, and spring-sustained die-carrying blocks placed within the cavities of the bed-plate, substantially as set forth.

In testimony that we claim the foregoing as our invention we affix our signatures in presence of two witnesses.

JOHN ZIMMERMAN.
JOHN K. UNDERDOWN.

Witnesses:
C. CLARENCE POOLE,
M. E. DAYTON.