Nov. 23, 1948. J. E. THOMAS 2,454,725

CAN PIERCER

Filed Jan. 26, 1948

Fig. 7

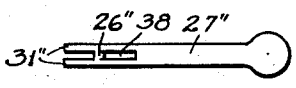
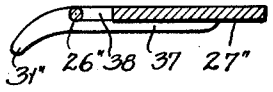


Fig. 8



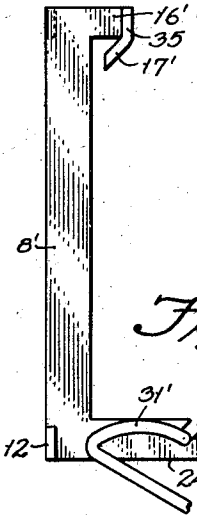


Fig. 5

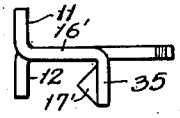


Fig. 6

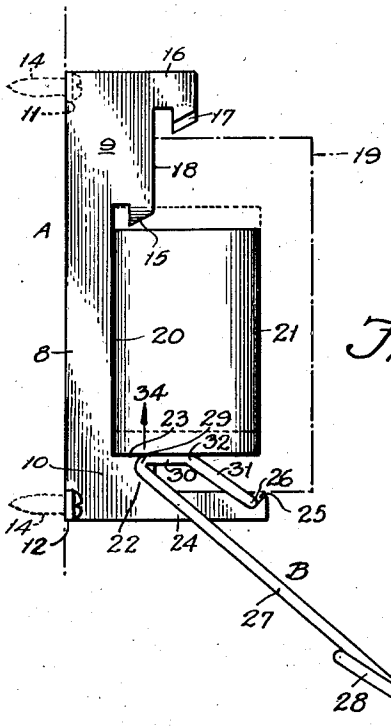


Fig. 1

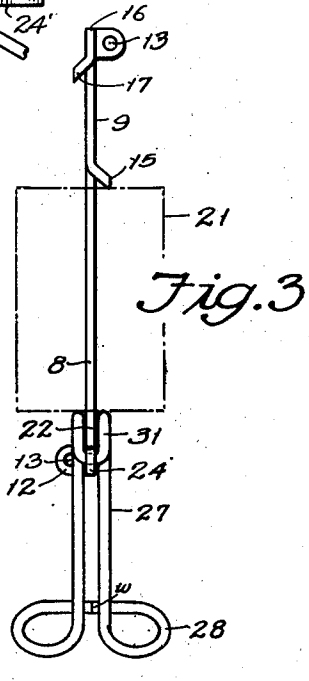


Fig. 3

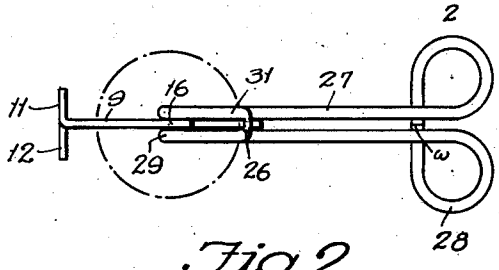


Fig. 2

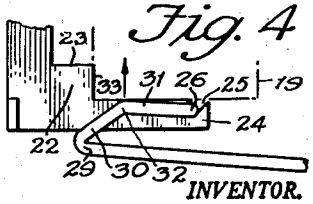


Fig. 4

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CAN PIERCER

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10 Claims. (Cl. 30—8)

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This invention relates to devices for piercing the containers of liquid canned goods such as canned milk, fruit juices, soups, etc., for the purpose of providing pouring holes therein.

The object of the invention is to provide a can piercing device:

a. That is capable of piercing cans, such as condensed milk cans, which do not have a rim flange at either end of the can;

b. That may be attached permanently to a supporting wall or panel in a kitchen so as to be ready for instant use;

c. That will pierce a can at the top so as to avoid any possibility of spilling the contents;

d. That is quite simple and inexpensive in construction;

e. That can be used to pierce cans of two different sizes.

One of the most important objects of the invention is reducing the fabricating expense down to the point where the device may be sold for a relatively nominal amount and thereby be available to all young families having babies for whom feeding formulas embodying the use of condensed milk, are being utilized.

Other objects will become apparent in the ensuing specifications and appended drawings in which:

Fig. 1 is a side view of a can piercer embodying my invention;

Fig. 2 is a plan view of the same;

Fig. 3 is a front view of the same;

Fig. 4 is a partial side view of the piercer in another position of operation;

Fig. 5 is a side view of a piercer embodying a modified form of the invention;

Fig. 6 is a plan view of the bracket member thereof;

Fig. 7 is a plan view of a modified form of pusher; and

Fig. 8 is a central longitudinal sectional view thereof.

I am aware that a number of prior proposals for devices to facilitate the piercing of holes in cans, have been made. However, such prior proposals embody fairly complicated and expensive structures, so much so that they have not proven practical for commercial production, and have therefore not become available to the public. Accordingly, my invention, in simplifying and reducing expense, actually has made it possible to provide a satisfactory can piercer that can be purchased by the public at large.

The can piercer of my invention comprises simply two elements, one a wall bracket carrying

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one or more piercing points and a fulcrum for a pusher, and the other a pusher which is fulcrumed on the bracket and is adapted to engage the bottom of the can and push it upwardly against a piercing point.

Referring now to the drawings, the wall bracket is indicated generally at A, and the pusher is indicated generally at B. The wall bracket A is formed of fairly heavy sheet metal (for example, having a thickness from $\frac{1}{16}''$ to $\frac{3}{32}''$) and comprises a waist portion 8, a head portion 9 at the upper end of the waist portion 8, and a combined can seat and fulcrum portion 10 at the lower end of the waist portion 8. The head and fulcrum portions 9 and 10 are provided with ears 11 and 12 respectively, extending laterally therefrom, the ear 11 extending on one side and the ear 12 on the other side of the bracket. The ears 11 and 12 are apertured as at 13 to receive screws (indicated in dotted lines at 14) by means of which the bracket may be attached to a supporting wall or panel.

The head portion 9 extends laterally beyond the waist portion 8 to provide an overhanging shoulder from which a piercing point 15 extends downwardly and laterally. At the upper end of the head 9 is an extension 16 overhanging the head 9 and terminating in an auxiliary piercing point 17 which projects downwardly and laterally.

The forward edge of the head 9 provides an abutment 18 against which the side of a tall can (indicated in broken lines at 19) may be positioned for piercing engagement with the point 17. The forward edge of the waist portion 8 provides an abutment 20 against which a smaller can 21 (such as a condensed milk can) may be positioned for piercing engagement with the point 15.

The can rest 10 includes a step 22 the upper edge of which defines a shoulder 23 on which the bottom of the small can 21 may rest preliminary to the piercing operation. The can rest portion 10 has an extension 24 the upper edge of which provides a support for the bottom of the larger can 19. The forward edge of the step 22 defines a shoulder 33 against which the side of the tall can 19 at its lower end may be positioned. The extension 24 also provides a fulcrum for the pusher B. In its outer end, it is formed with a notch 25 that extends downwardly and rearwardly. In the notch 25 is loosely received a trunnion member 26 of the pusher B.

In the preferred form of the invention, the pusher B is inexpensively formed from a length

of fairly heavy wire (e. g. from 3/32" to 1/8" diameter). The pusher B includes a lever portion 27 having handle means 28 at its outer end. The handle means 28 comprises a pair of loops, and the lever portion 27 comprises two parallel extensions of these loops. The fulcrum trunnion 26 is disposed intermediate the ends of the lever member 27. In order that the entire pusher may be formed of wire, the two shafts comprising the lever member 27 are return bent to form rounded pressure applying nose portions 29, and are connected to the trunnion 26 by two pairs of short arms 30 and 31. The arms 30 and 31 are disposed at an obtuse angle, defining between them a nose 32. The trunnion 26 constitutes simply a bend in the wire, joining the arms 31. The handle loops 28 may be formed at the respective ends of the length of wire from which the pusher is constructed, and may have their respective ends butt-welded together as at *w*.

The bracket A is very inexpensively constructed by a die blanking operation in which the entire bracket is punched out of sheet stock. In a forming or bending operation, which may be subsequent to the blanking operation, the points 15 and 17 and the ears 11 and 12 are bent laterally from the body of the blank. The points 17 are then sharpened by having their projecting corners beveled as indicated in Figs. 1 and 3. The beveling may be in a plane parallel to the plane of the body of the bracket, so as to facilitate the beveling operation. A deburring operation may of course be interposed between the blanking and the bending or between the bending and the sharpening operations. After sharpening, or immediately prior thereto, the entire bracket may be finished by electro-plating with a suitable non-tarnishing metal, or by enamelling. The pusher B may likewise be electroplated or enamelled. The entire device is then ready for packing for shipment. It will be obvious from the foregoing description of the manufacture of the device that it may be made in large quantities at a very small expense and may therefore be sold for a small sum. This element of inexpensiveness is one of its chief advantages. At the same time, the operation of the device is quick, satisfactory and simple.

In piercing a small can, one side of the can is positioned against the abutment edge 20 of the bracket and the bottom is rested upon the shoulder 23 of the step 22. As the can is moved into this position, it will engage the arms 31 and swing the pusher B counterclockwise, as viewed in Fig. 1, to the position shown in which the nose portions 29 just contact the bottom of the can. By pressing the fingers against the loops 28 and pressing downwardly, the nose portions 29 will press upwardly against the bottom of the can directly below the point 15, moving the can upwardly as indicated by the arrow 34 and forcing the top of the can against the piercing point 15. As the point 15 pierces the top of the can, the opening made thereby will be widened by reason of the lateral inclination of the point 15. The can may then be rotated approximately 180 degrees and again pierced to provide a second opening, whereby one opening may be used for pouring while the other opening admits air.

In piercing a large can 19, the side of the can is placed against the abutment edges 18 and 33, and the bottom of the can is rested on the upper edge of the extension 24. As the can is moved into this position, the arms 31 will be pressed downwardly, shifting the pusher B to the position shown in Fig. 4. Downward pressure against the loops 28 will cause the can to be raised against the piercing point 17, the nose portions 32 engaging the can directly below the point 17. It may be noted at this point that the angular relation between the arms 30 and 31, and their respective lengths, are such that pressure will be applied to either a large or a small can directly beneath its respective piercing point.

It is to be noted that the arms 30 and 31 are substantially spaced from the lever shaft 27, and that both the arms 30, 31 and the lever shaft 27 are in spaced pairs, the members of which are parallel and spaced so as to fairly closely embrace the sides of the fulcrum extension 24. It may also be noted that the extension 24, being relatively thin and flat, cooperates with the arms 30, 31 and with the lever shafts 27 to prevent wobbling movement of the pusher either at right angles to or around the common axis of the lever shaft members 27. Thus the return bent relation of the arms 30 and shaft members 27 functions: (*a*) to dispose the trunnion 26 intermediate the ends of the pusher; (*b*) to provide the rounded noses 29 for smooth engagement with the bottom of the can; and (*c*) to provide the pairs of arm members 30 and shaft members 27, the members of which are spaced and parallel to closely embrace the extension 24, and the pairs of which are likewise spaced, whereby to spread the area of engagement with the fulcrum member 24 sufficiently to fix the axis of swinging movement of the pusher quite definitely at right angles to the plane of the extension 24.

In Figs. 5 and 6 I have shown a modification of the invention, designed to be used in piercing only one size can. The step 22 is omitted, the can being rested directly on the fulcrum member 24'. At the upper end of the waist member 8' is a head extension 16' the outer end of which is bent at right angles to form an arm 35 from which a piercing point 17' depends. The point 17' is bent toward the waist member 8' so that its point will enter the top of a can adjacent the rim, and the opening will be widened toward the center of the can, thus positioning the turned in web at the upper side of the opening, in the pouring position.

Fig. 5 also illustrates how the arms 31' may be curved so as to provide a camming action in which the pressure is gradually applied, with a maximum leverage at the beginning of the piercing operation when resistance to piercing is greatest, and an increase in the rate of upward movement applied to the can, after the initial puncture has been effected.

In Figs. 7 and 8 I have shown a modification of the pusher, constructed from sheet plastic, blanked and perforated, then hot-formed to a channel shape, including a web 27'' and side flanges 37 which are extended to form spaced parallel arms 31''. The arms 31'' are adapted to embrace the fulcrum 24 in the manner described above for the lever shafts 27 and arms 30, 31. The fulcrum 26'' may be an integral part of the sheet from which the pusher is blanked, bridging between the arms 31'', or may be a separate metal pin, set into openings in the arms 31'', or moulded therein (in which case the entire pusher would be moulded).

Defined between the arms 31'' and between the trunnion 26'' and the adjacent end of the web 27'' is a slot 38, in which the end of the fulcrum 24 is receivable.

I claim:

1. A can piercer comprising a bracket and a pusher, said bracket being stamped from heavy sheet metal and including a waist portion the forward edge of which provides a positioning abutment for engagement with the side of a can, a head portion overhanging said forward edge and having a downwardly extending piercing point, and a can seat portion extending beneath said head portion and having a fulcrum in which said pusher is pivoted for upward movement against the bottom of the can.

2. A can piercer as defined in claim 1, wherein said waist portion, head portion and can seat portion are positioned in a common flat plane.

3. A piercer as defined in claim 1, wherein said pusher is in the form of a lever having a fulcrum trunnion intermediate its ends, pivoted in said fulcrum seat, an extremity on one side of the fulcrum to engage the bottom of the can, and a handle portion on the other side of the fulcrum for operator engagement.

4. A can piercer comprising a bracket member and a pusher member, said bracket member having at its upper end a head portion provided with a downwardly extending piercing point and having at its lower end a fulcrum member projecting below said head member and provided with a fulcrum seat, said pusher comprising a trunnion adapted to be received in said fulcrum seat, a pair of spaced arms extending on one side of said trunnion and having end portions adapted to engage the bottom of the can to exert upward pressure thereagainst, said arms being spaced so as to closely embrace the side of said fulcrum member, said fulcrum member being flat so as to constitute a means cooperating with said arms to position said pusher for swinging movement in a fixed plane, and said pusher including a lever portion extending from said arms on the opposite side of said trunnion.

5. A can piercer as defined in claim 4, wherein said fulcrum seat comprises a notch extending upwardly and forwardly.

6. A can piercer as defined in claim 4, wherein said pusher is composed entirely of wire including a web portion constituting said trunnion, a pair of arms bent from the respective ends of said trunnion, and extending parallel to each other, and a pair of lever shafts bent from the ends of said arms opposite said trunnion and extending in substantially the reverse direction to the direction of extension of said arms from said trunnion, the outer ends of said lever shaft being provided with handle means, and said lever shafts and arms both being spaced to closely embrace the sides of said fulcrum member along lines that are spaced from each other.

7. A piercer as defined in claim 4, wherein said arms are arched to provide cam surfaces for engagement with the bottom of the can in a manner to increase the leverage of the pusher at the start of a piercing operation.

8. A piercer as defined in claim 4, wherein said pusher is of molded material and includes a lever shaft and a pair of arms projecting from one end of said lever shaft, said arms being spaced to define a slot adapted to receive said fulcrum, with the sides of said slot embracing said fulcrum sufficiently closely to support said pusher against lateral wobbling movement, and including a fulcrum pin defining one end of said slot, said fulcrum having a notch receiving said pin.

9. A can piercer as defined in claim 1, wherein said head portion has a forward edge constituting an abutment for the side of a longer can than the previously mentioned can and has an extension overhanging said abutment edge and provided with a downwardly extending auxiliary piercing point for the longer can, and wherein said can seat member has a step the upper edge of which provides a support for the shorter can and the forward edge of which provides an abutment shoulder for the lower portion of the side of the longer can.

10. A can piercer as defined in claim 9, in which said pusher embodies an arm having an upper side that is of obtuse angular shape from end to end, providing a pair of spaced extremities, the outer one of which is adapted to engage the bottom of the smaller can directly beneath its piercing point and the other of which is adapted to engage the bottom of the longer can directly beneath its piercing point.

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The following references are of record in the file of this patent:

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