March 23, 1948. G. R. SQUIRES 2,438,376

CAN OPENER

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Fig. 1.

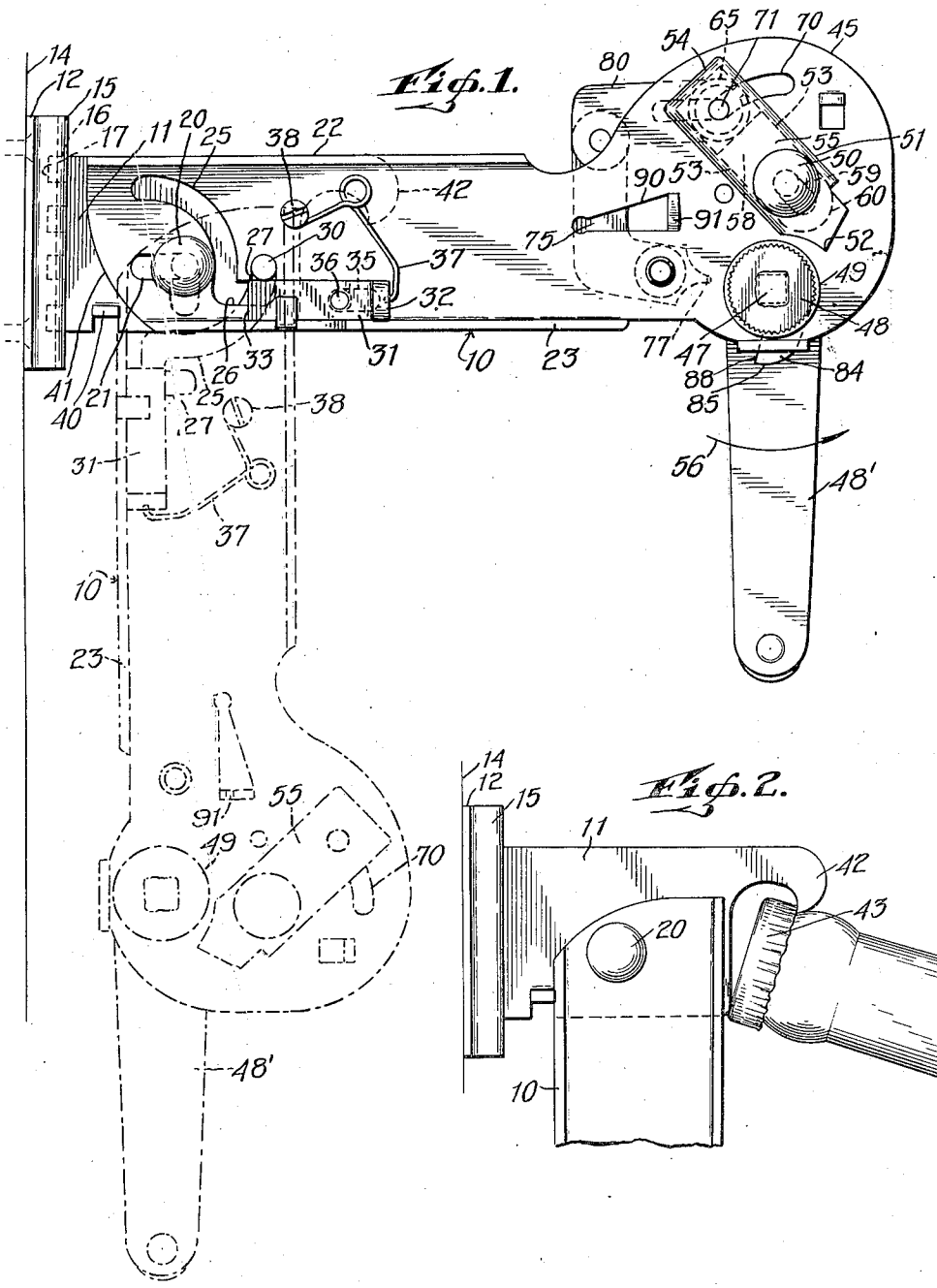


Fig. 2.

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Fig. 3.

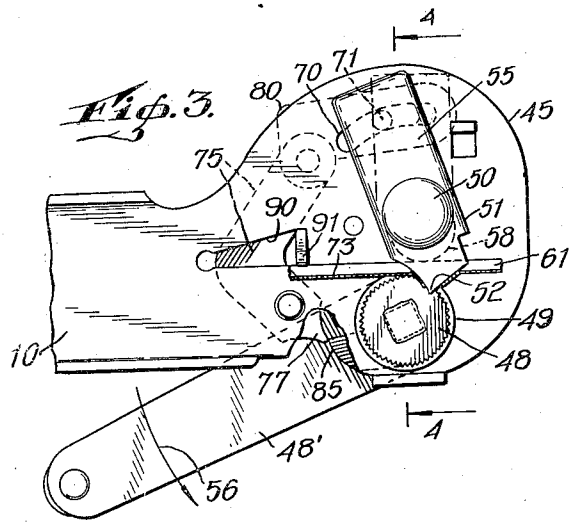


Fig. 4.

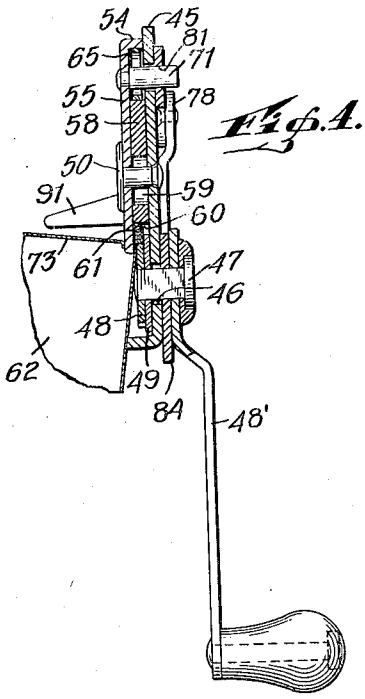


Fig. 5.

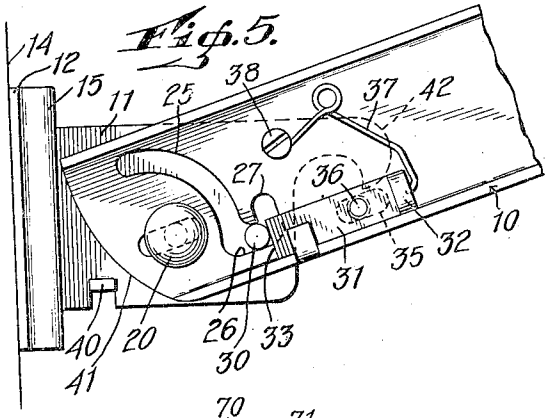
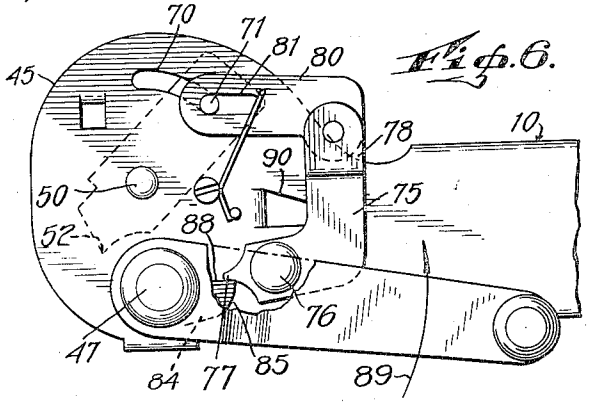


Fig. 6.



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CAN OPENER

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Application February 26, 1945, Serial No. 579,714

9 Claims. (Cl. 30—8)

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This invention relates to a simple and effective mechanism for opening rolled-rim-sealed cans, such as commonly used for containing foods and other commodities. One object is to provide an improved apparatus for the above and similar purposes.

Another object is to provide a can opener having a blade and improved means for causing the blade to automatically puncture a can; and, more specifically, to provide a means for such purpose which will not require auxiliary hand operated levers or complicated parts.

A further object is to provide an improved means for withdrawing the blade when the cutting operation has been completed.

Another object is to provide an improved means for guiding the can.

A further object is to provide an improved foldable supporting means for securing a can opener mechanism to a wall or other suitable support.

Another object of the invention is to provide an improved device of this kind which has a convenient bottle cap remover thereon.

Additional objects of the invention are to effect simplicity and efficiency in such devices and to provide a simple device of this kind which is economical, convenient, durable, and reliable in operation, and economical to manufacture and easy to install.

Still other objects of the invention will appear as the description proceeds; and while herein details of the invention are described in the specification and some of the claims, the invention as described in the broader claims is not limited to these, and many and various changes may be made without departing from the scope of the invention as claimed in the broader claims.

The inventive features for the accomplishment of these and other objects are shown herein in connection with an improved can opener which briefly stated, includes a bracket plate provided with a bearing opening receiving a shaft having a crank fast on one end and, on the other end, a toothed traction wheel against which the rim of the can is engaged. A knife plate having a cutting end is pivoted on the plate near the wheel with the cutting end normally angularly disposed to the rear relative to the forward rotation of the wheel; and means operated by the shaft as the shaft rotates forwardly to swing the knife plate forwardly to cause the pointed knife end to puncture a can head the rim of which is between said wheel and said cutting end. Said means is also operated by the shaft when the shaft is reversed to pull the knife back to normal non-

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operating position. If desired, a spring pressed pressure block is mounted on the bracket for pressing the can rim on the tooth wheel.

The bracket plate may also be provided with a guide projection at right angles to the plate against which the can may be positioned with the rim against the wheel while the can is being opened.

Instead of having the bracket plate fixed on the wall, it may be pivoted to a fixed bracket mounted on the wall; and means are provided for holding the pivoted bracket plate in horizontal position when it is raised from a pending position. If preferred, the can opener may be mounted directly on a fixed bracket or other support.

When the pivoted bracket plate is pending, it may be moved to horizontal position by grasping the pending handle and moving the handle outwardly and upwardly, while pivotal movement between the handle and pivoted bracket takes place.

In the accompanying drawing showing, by way of example, one of many possible embodiments of the invention,

Fig. 1 is a side elevation, the solid lines showing the can opener in operative position while the dotted lines show the inoperative and folded position;

Fig. 2 is a fragmental end elevation showing the device used to remove a bottle cap;

Fig. 3 is a fragmental side elevation showing the can opener parts in cutting operation;

Fig. 4 shows a section on the line 4—4 of Fig. 3;

Fig. 5 is a fragmental side elevation showing a position of the pivoted bracket moving to operative position; and

Fig. 6 is a fragmental side elevation showing the can opener in position to restore the blade to normal position.

My improved can opener is here shown mounted on a pivoted bracket plate 10 pivotally mounted on a fixed bracket plate 11 mounted on a base plate 12 adapted in any suitable manner to be secured to a wall 14. The base plate has a wide flat vertical rib-portion 15 offset from the wall and provided with slots 16 therein to receive projections 17 on the inner end of the fixed bracket plate 11 which extends outwardly in a vertical plane perpendicular to the base plate, said projections 17 passing through said openings 16 and being turned against the inner face of the rib to hold the bracket plate in place.

A headed pivot pin 20 secured in the mid-part of the fixed plate is received in a short elongated longitudinal opening 21 near the inner end of

pivoted bracket plate 10, which is disposed flat against the bracket plate and adapted to be pivotally moved from the vertical position shown by the dotted lines of Fig. 1 to a horizontal position, and provided with lateral flanges 22, 23 extended in a direction away from said fixed plate. Said pivoted plate 10 is provided with an arcuate slot 25 more remote from the pivot pin than is longitudinal opening 21. The slot is coaxial with the end of the longitudinal slot most remote from the arcuate slot and extends about 90 degrees to near the lower inner flange 23, the lower or inner end of the arcuate slot being extended a short distance outwardly from the generating center of the arcuate slot to form an extension portion 26 and then a short distance perpendicularly to the flange to form a locking portion 27. A holding pin 30 fixed in the fixed plate and receivable in said arcuate slot 25 is adapted, when the pivoted plate is moved to horizontal position and then moved inwardly to relatively pass into said short extension portion 26 and then on slight downward movement of the pivoted bracket plate into the locking portion 27.

A bolt 31 slidable on the lower flange and disposed in a direction away from the arcuate slot and having a laterally turned outer end 32 has its active inner end 33 normally disposed to cover the extension portion and to close the entrance to said locking portion 27. The pivoted plate is provided with a longitudinal short slot 35 adjacent to the bolt; and a pin 36 fast in the bolt engages in said short slot to limit the movement of the bolt. A spring 37 anchored on the pivoted plate by a screw 38 presses on the outer end of the bolt 31 to normally hold the bolt in position to close the entrance to the locking portion 27.

When the pivoted plate 10 is raised from the pending position to above the horizontal position as in Fig. 5 the holding pin relatively moves into the lower part of the arcuate slot, the pivoted bracket may be forced inwardly causing the holding pin to push the bolt 31 from the extension portion 26 and allow the locking portion 27 to move down and receive the holding pin, whereupon the spring 37 presses the bolt under the holding pin and holds the holding pin in the locking portion. Withdrawal of the bolt 31 by the hand on the laterally turned end 32 allows the pivoted bracket to be moved upwardly and outwardly to allow the holding pin to relatively move into and through the extension portion 26 into the arcuate slot 25, whereupon the pivoted bracket may be allowed to fall to the pending position of the dotted lines, the lower part of the inner end of the fixed bracket plate having a laterally turned lug 40 to engage and stop the pivoted bracket plate when in lowered position. The inner end of the pivoted plate is cut away, as at 41 to prevent interference with said stop when the pivoted plate moves to horizontal position.

The upper part of the outer end of the fixed plate has an outward extension having a downturned hook 42 spaced from the outer flange of the pivoted plate when lowered to serve as a bottle cap remover 43 (Fig. 2) or to loosen container covers.

The outer end of the pivoted bracket plate is widened as at 45 and provided at its lower part, when raised, with a bearing opening 46 (Fig. 4) receiving a short rotary shaft 47 having a crank 48' fast on the outer end and a toothed traction wheel 48 on its inner end and a flange wheel 49

disposed between the toothed wheel and plate 10.

A pivot pin 50 spaced above the shaft and mounted in the plate pivotally holds a knife plate 51 having a pointed inner cutting end 52, and narrow side and outer end flanges 53, 54 (Fig. 1) engaged on the bracket plate, the web portion 55 of the knife plate being pivoted on the pivot pin 50 near the pointed end with the pointed end normally angularly disposed to the rear (Fig. 1), relative to the forward rotation of the wheel, of a line connecting the axes of said pin and shaft. The direction of forward rotation is shown by the arrow 56 of Fig. 1.

A pressure block 58 slidable between said side flanges between the knife plate and bracket plate and having a longitudinal slot 59 received on the pivot pin, has a curved inner end face 60 engageable with the rim 61 of a can 62 engaged on the teeth of the toothed wheel 48. A strong annular spring 65 of flat spring metal is compressed between the outer end of the pressure block 58 and the end flange 54 for pressing the rounded end 60 on the can rim.

The bracket plate 10 has at the outer end portion of the knife plate an arcuate slot 70 coaxial with the pivot pin 50; and a link engaged pin 71 fast on the outer end of the knife plate projects through said last named slot. Mechanism is provided connected with said last named pin 71 for pivotally moving said knife plate to bring the pointed end 52 nearer the axis of the wheel than are the teeth, thereby to puncture the can head 73, Said mechanism includes an L-lever 75 (Fig. 6) pivoted near its inner end on a pin 76 fast on the pivoted bracket plate 10 near said shaft 47 and provided with a somewhat pointed end forming an end projection 77 pointing toward the shaft. The outer arm 78 of the L-lever 75 points rearwardly relative to the forward rotation of the crank and extends to near the link engaged pin 71 in the end of the knife plate. A link 80 pivoted to the outer end 78 of the L-lever has a longitudinal slot 81 receiving the link engaged pin.

A cam plate 84 on the shaft has a forward cam edge 85 (Fig. 3) adapted to engage said end projection 77 as the shaft rotates forwardly in the direction of the arrow 56, thereby to rock the L-lever and cause the link to push on said link-engaged pin and rock the knife plate to cause the pointed knife end 52 to approach the can and puncture the can head, the cam edge 85 then passing said end projection as shaft 47 continues to rotate to cause the peripheral portion of the can head to advance on the knife end to cut out the head.

Said cam plate has a substantially radial rear edge-shoulder 88 (Fig. 6) adapted, when the crank shaft is rotated in the reverse direction, to engage said end projection 77 and rock the L-lever in reverse direction, causing the link 80 to pull the knife back to the normal non-operative position as shown in Fig. 6.

The bracket plate 10 has a V-shaped cut 90 (Fig. 3), the material of which is turned at right angles to the plate at the inner face thereof, to form a guide projection 91 against which the can 62 (Fig. 4) may be positioned while being opened.

As the shaft 47 is perpendicular to the pivoted plate 10, the crank 48' is adapted to hang substantially vertically and when the pivoted plate is pending, the crank and pivot plate project a minimum distance, thus to economize space in the kitchen. When the bracket plate 10 is thus

pending it may be moved to horizontal position by grasping the pending crank and moving it upwardly and laterally outwardly, while pivotal movement between the crank and the pivoted bracket plate 10 takes place, the outward movement causing said holding pin 30 to force the bolt 31 relatively outwardly until the holding pin is disposed under the locking portion which moves downward to receive the pin 30 and allow the bolt to snap beneath the pin. The crank may be held substantially vertically during all said movements while the pivoted bracket is raised and locked.

The operation will be obvious from the foregoing. After the pivoted bracket plate 10 has been raised as above described or in any effective manner and locked, the can 62 placed as indicated in Fig. 4, with the rim 61 between the toothed traction wheel and the pressure block 58 the crank is then revolved forwardly bringing the cam edge 85 against the end projection 77, causing the pointed end of the knife plate to puncture the can top, and causing the pressure block to press the can rim onto the toothed wheel. The crank is then revolved forwardly until the top is cut from the can in the usual manner, after which the can is turned in reverse direction in the direction of the arrow 89 (Fig. 6) until the shoulder 88 engages the end projection 77 and restores the knife plate and associated parts to their original positions.

The invention claimed is:

1. In combination, a substantially horizontal bracket plate disposed in a vertical plane, the outer end being provided with a bearing opening; a shaft in said opening having a crank fast on one end and a traction wheel on the other; a pivot pin above the shaft fast in the plate; a knife plate having a cutting end, and pivoted on the pivot pin with the pointed cutting end normally angularly disposed rearwardly relative to the forward rotation of the wheel; a lever pivoted near its inner end on the bracket plate near said shaft and having an end projection pointing toward the shaft; the outer arm of the lever having its outer end part approximately parallel to said knife plate; a link connecting the outer end of the lever and the outer end of the knife plate; a cam plate on said shaft having a forward cam edge adapted to engage said end projection as the shaft rotates forwardly to cause the pointed knife end to puncture a can head the rim of which is placed against said wheel between said wheel and blade.

2. A combination as in claim 1, said cam plate having a rear shoulder adapted when the shaft is reversed to engage the end projection to rock the lever to pull the knife back to normal inoperative position.

3. In a combination as in claim 1, a pressure block slidable between said knife plate and bracket plate; and a spring mounted for pressing pressure block on the can rim disposed between the block and wheel.

4. In combination, a support; a shaft rotatably mounted on the support and having a crank and a traction wheel fast thereon; a knife plate having a cutting end, and intermediately pivoted on the support with the cutting end near the wheel and normally angularly disposed rearwardly relative to the forward rotation of the wheel; a lever intermediately pivoted on said support and having an end projection pointing toward the shaft; a link connecting the outer ends of the lever and knife plate; a cam plate on said shaft having a forward cam edge adapted to engage said end projection as the shaft rotates forwardly to cause the pointed knife end to puncture a can head the rim of which is placed against said wheel between said wheel and blade.

5. In combination, a support; a shaft rotatably mounted on the support and having a crank and a traction wheel fast thereon; a knife plate having a cutting end, and intermediately pivoted on the plate with the cutting end near the wheel and normally angularly disposed rearwardly relative to the forward rotation on the wheel; a lever intermediately pivoted on said support at a point remote from the pivot point of the knife plate and having an end projection pointing toward the shaft; connecting means connecting the outer ends of the lever and knife plate; a cam plate on said shaft having a long forward cam edge adapted to engage said end projection as the shaft rotates forwardly to cause said cutting end to puncture a can the rim of which is placed against said wheel between said wheel and blade.

6. A combination as in claim 5 said connecting means being a lost motion connection.

7. A combination as in claim 5, said cam plate having a rear shoulder adapted when the shaft is reversed to engage the end projection to rock the lever to pull the knife back to normal inoperative position.

8. In combination, a bracket plate provided with a bearing opening; a shaft in said opening having a crank and a traction wheel fast thereon; a knife plate intermediately pivoted on the plate and having a cutting end near the wheel, the plate being normally angularly disposed with the cutting end disposed rearwardly relative to the forward rotation of the wheel; and means operated by the shaft as the shaft rotates forwardly to swing the knife plate forwardly to cause the pointed knife end to puncture a can head, the rim of which is between said wheel and cutting end; and a pressure block slidable between said knife plate and bracket plate; and a spring mounted for pressing the pressure block on the can rim when disposed between the block and wheel.

9. A combination as in claim 8, said knife plate having a pair of lateral flanges engaging the bracket plate, between which flanges the pressure block slides.

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