

April 15, 1930.

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1,754,315

CAN OPENER

Filed March 23, 1925

2 Sheets-Sheet 1

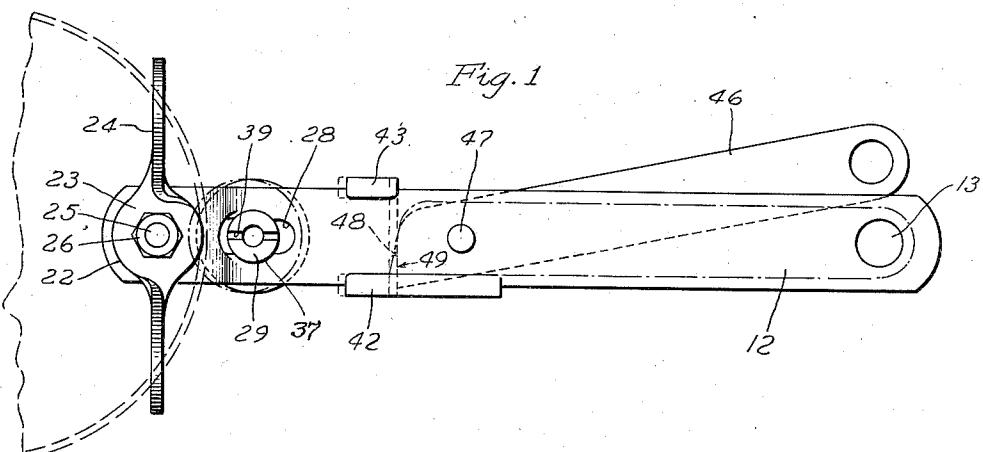


Fig. 1

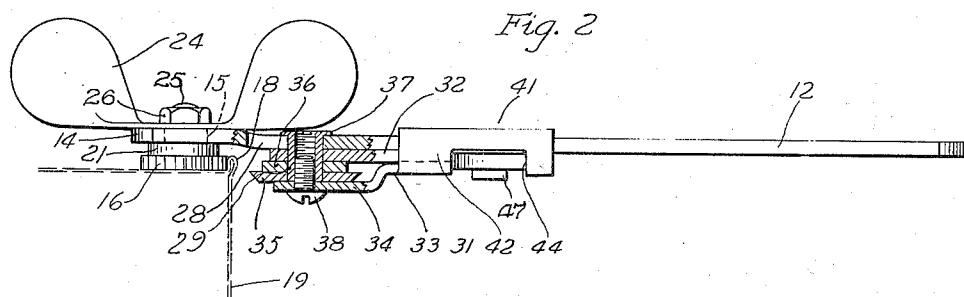


Fig. 2

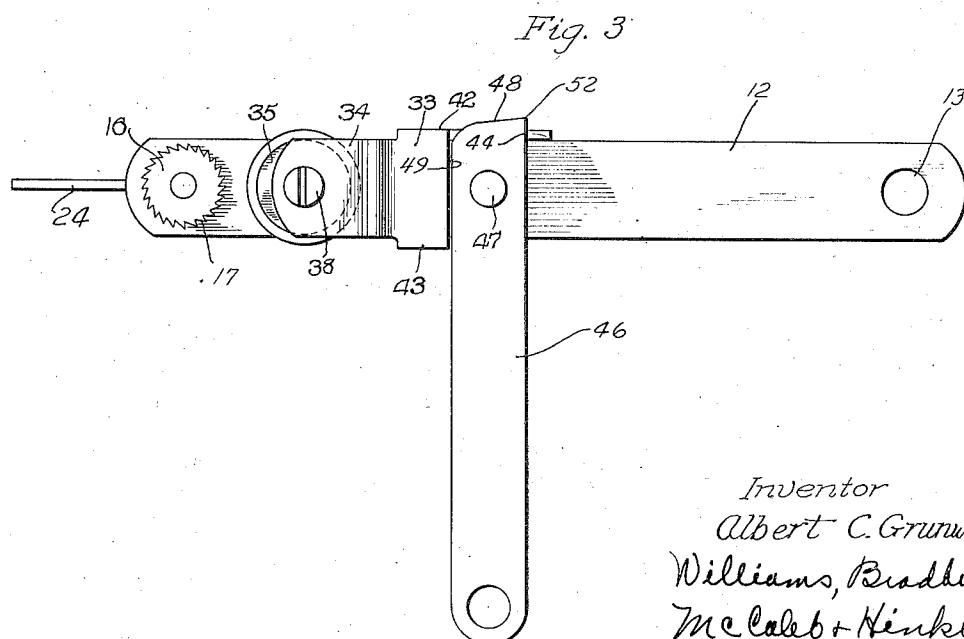


Fig. 3

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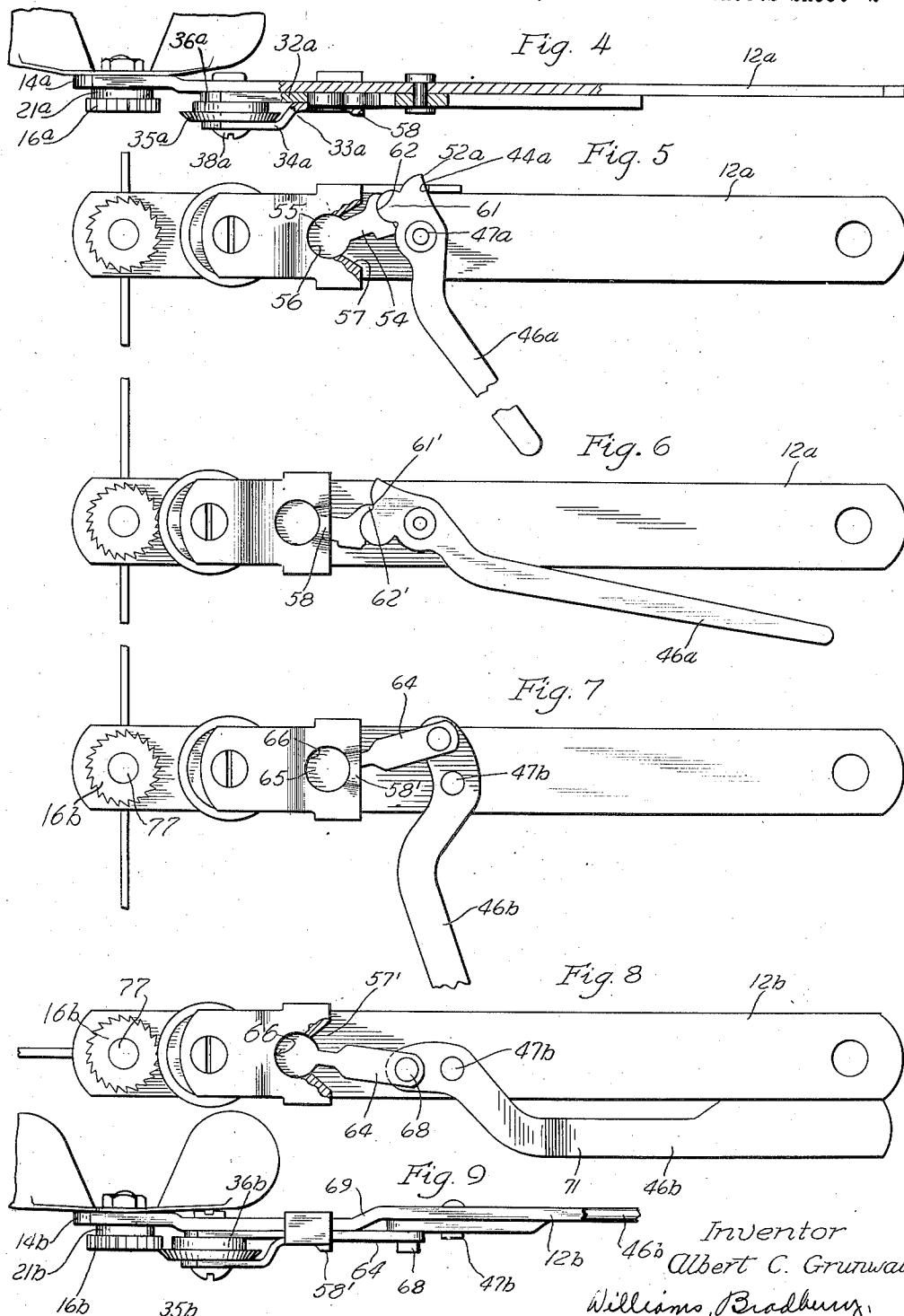
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2 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE

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## CAN OPENER

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The present invention relates to can openers and pertains more particularly to that type of can opener employing a rotatable cutting disk which is moved about the edge of the can under the action of a serrated feeding disc adapted to be rotated while in pressure contact with the can.

Some of the objects of my invention are: First, to provide an independently rotating 10 backing disc or wheel above the cutting disc for backing up the serrated feeding disc above the line of cutting; second, to provide an improved construction of slide having a two-point support of the pivot on which the cutting and backing discs are pivoted; and third, to provide a can opener of which the major portion of the parts are constructed as stampings.

Other objects may be apparent from the 20 following description of my invention. In the drawings accompanying this description:

Figure 1 is a plan view of the preferred embodiment of my invention, a portion of the can being operated upon being illustrated 25 fragmentarily;

Figure 2 is a side elevational view of the device, a portion being broken away in section;

Figure 3 is a bottom plan view of this embodiment;

Figure 4 is a side view of another embodiment, a portion being broken away in section;

Figures 5 and 6 are bottom plan views of this second embodiment, showing the slide in 35 different positions;

Figures 7 and 8 are similar views of another embodiment of my invention, and

Figure 9 is a fragmentary side elevational view of this latter embodiment.

Referring to the form illustrated in Figures 1, 2, and 3, the can opener comprises a shank or handle portion 12, preferably punched out of flat bar stock. The outer end of this shank or handle portion is provided 45 with an aperture 13, by which the device may be hung upon a nail or hook. As shown in Figure 2, the other end of this shank 12 has a raised portion 14 which is elevated slightly above the plane of the main shank portion. 50 This raised portion is provided with a pivot

aperture through which extends the pivot shank 15 of the serrated feeding wheel 16. As shown in Figure 3, the periphery of this wheel or disc has sharp teeth or serrations 17 which are adapted to bite into the inner side of the can flange 18 for advancing the can 55 opener around the can 19. The serrated feeding wheel 16 is formed integral with a collar 21 which is of larger diameter than the pivot shank 15 and forms a shoulder bearing 60 against the under side of the raised shank portion 14. A rotating member 22 comprising a central disc portion 23 and lateral wing extensions 24 seats on the upper shouldered end of the pivot shank 15. The reduced upper 65 end 25 is threaded for receiving a nut 26 by which the disc portion 23 of the rotating member is rigidly clamped to the upper shoulder of the pivot portion 15. The rotatable 70 member 22 is constructed as a one-piece stamping by punching the disc portion 23 and the lateral wing portions 24 from a piece of flat stock and then twisting the wing portions 24 into their upright parallel relation shown in Figure 2.

Punched in the shank portion 12 is a longitudinal slot 28 for receiving the upper end of the pivot 29 carried by the slide 31. This slide comprises upper and lower plates 32 and 33 of a width substantially equal to the width 75 of the shank or handle 12. The bottom plate 33 has a dropped portion 34 provided to form a space between the front ends of the plates 32 and 33. Supported between these spaced ends are the rotatable cutting disc or wheel 35 and the backing disc 36. These two discs are supported on a tubular pivot 29. This tubular pivot extends through a snugly fitting hole in the upper plate 31 and passes through the slot 28 in the shank or handle portion 12. The flanged upper end 37 bears along the sides of the slot 28 and guides the front end of the slide 31 in its sliding movement along the shank 12. A screw 38 passes up through an opening in the dropped portion 34 of the bottom plate and threads into the tapped bore of the tubular pivot 29. A screw driver kerf 39 may be provided in the upper flanged end of the pivot for holding this end of the pivot 80 while driving the screw 38 into its lower end. 100

The rear end of the slide 31 has guided support on the shank 12 through guide means 41 engaging with the shank 12. This guide means comprises two guide flanges 42 and 43 which extend up along the sides of the shank portion 12 and are folded over on the upper side of the shank portion, as illustrated in Figure 1. The overlapping guide flange 42 is extended rearwardly from the end of the plate portion 33 so as to carry a shoulder 44 depending below the bottom of the shank portion 12. It will be understood that this bottom member 33, including the dropped front end 34 and the guide flanges 42 and 43, can be constructed as a sheet metal stamping.

For moving the slide 31 towards and away from the serrated feeding wheel 16, a camming lever 46 is pivotally mounted on the shank 12 on a pivot pin 47 located adjacent the slide 31. The front end of this lever 46 has a sloped camming end 48 which is adapted to bear against the rear ends of the upper and lower plates 32 and 33 composing the slide. The rear ends of these plates terminate substantially flush and define a rear shoulder 49 against which the lever 46 is operative to exert camming pressure. The lever 46 is of a thickness substantially equal to the combined thicknesses of both plates 32 and 33 so that its camming pressure is applied equally to both, and consequently both plates move forwardly as a unit. It will be observed that the guide flanges 42 and 43 laterally confine the rear end of the upper plate 32 so that no attachment between the rear ends of these plates is necessary.

This operation of camming the slide forwardly towards the serrated feeding wheel occurs when the lever 46 is swung inwardly towards the shank 12. This follows naturally from the gripping of the shank and the camming lever, this gripping pressure on the two tending to squeeze the same together and to hold the slide 31 in its forward position in pressure engagement with the can. The slide is retracted into its position to clear the edge of the can by swinging the lever laterally to the position indicated in Figure 3. This brings the lateral edge of the lever 46 into engagement with the shoulder 44 and retracts the slide.

It will be observed from Figure 2 that when the slide has been thrust forwardly the beveled edge of the cutting disc 35 will engage the side of the can just below the bottom of the feeding wheel 16, the upper surface of the cutting disc and the bottom surface of the feeding wheel lying in substantially the same plane. As a result, the feeding wheel will afford a point of backing support at the very plane of cutting so that the metal of the can will not be merely indented by the cutting disc but will be held for a sharp shearing cut by the disc. The upper backing disc 36, which is rotatable on the pivot 29 in-

dependently of the cutting disc 35, co-operates with this effective cutting operation by backing up the outer side of the can flange 18. This backing disc 36 is of smaller diameter than the cutting disc 35, proportioned so that it will engage the can flange 18 under considerable pressure when the cutting disc is shearing the side of the can. It will be observed that this backing disc 36 lies in the same plane as the feeding wheel 16 so that the flange 18 of the can is rigidly held between these two rotatable elements and cannot fold outwardly under the action of the cutting disc. The presence of this backing disc 36, in the same plane as the feeding wheel 16, also enables this feeding wheel to obtain a more effective grip on the inner side of the can flange 18 for advancing the can opener around the edge of the can. It will of course be understood that this advancing movement is obtained by rotating the feeding wheel through the wing extensions 24 of the rotating member 22.

The parts are so proportioned that the cutting disc 35 is shearing the side of the can and the backing disc 36 is in pressure contact with the flange 18 of the can when the actuating lever 46 has been squeezed inwardly to the position approximately indicated in full lines in Figure 1. This presents the full width of the sloped end 48 against the rear shoulder 49 of the slide. By forcing the lever 46 all the way in, into substantial parallelism with the shank 12, as indicated in dotted lines in Figure 1, additional motion can be imparted to the slide by the pointed nose 52 of the lever thrusting against the shoulder 49 of the slide. This additional movement compensates for wear of the parts and variation in the thicknesses of the metal of the cans.

The embodiment shown in Figures 4, 5, and 6 is generally similar to that just described, with the exception of the operative connection between the actuating lever and the slide. In this instance, the actuating lever 46<sup>a</sup> is connected to the slide through a link 54 which operates in the manner of a toggle link. This link has a circular disc-like end 55 which sets in aligned circular holes 56—56 drilled or punched through the two plates 32<sup>a</sup> and 33<sup>a</sup> of the slide. The link 54 is of a thickness substantially equal to the combined thicknesses of the plates 32<sup>a</sup> and 33<sup>a</sup> so that its circular end substantially fills the aligned holes 56—56 in both plates and imparts simultaneous movement to both plates. The uppermost plate 32<sup>a</sup> which lies adjacent the shank 12<sup>a</sup> has a tapered opening 57 entering its opening 56 from the end of the plate, the inner end of this tapered opening 57 being smaller than the diameter of the opening 56. The other plate 33<sup>a</sup> of the slide has a bridge of metal 58 punched outwardly so as to form a confining strap for holding the circular end of the link 130

54 in the holes 56—56. This bridge of metal is formed by punching that portion of the metal in the plate 33<sup>a</sup> which lies directly below the tapered opening 57 of the plate 32<sup>a</sup> downwardly or outwardly from the plane of the plate 33<sup>a</sup>, as indicated in Figure 4.

The actuating lever 46<sup>a</sup> has a circular projection 61 projecting from its side for engagement in a circular socket-like recess 62 in the outer end of the link 54. An outer nose 52<sup>a</sup> on the actuating lever 46<sup>a</sup> is adapted to engage the depending shoulder 44<sup>a</sup> for retracting the slide, in the manner described of the previous embodiment. The length of the link 54 and the location of the pivotal center 47<sup>a</sup> are so proportioned that as the center of the circular projection 61 approaches the center line joining the center 47<sup>a</sup> and the disc end 55 the cutting disc 35<sup>a</sup> and backing disc 36<sup>a</sup> will be brought into operative engagement with the can. At this time a powerful toggle action is obtainable through the link 54 and a heavy pressure can be transmitted to the slide. The engagement of the end 62' of the link 54 against the abutment corner 61' on the actuating lever limits the throw of the actuating lever so that it cannot be moved entirely over center. This embodiment of can opener has the same general combination of feeding wheel 16<sup>a</sup>, cutting disc 35<sup>a</sup>, and operating disc 36<sup>a</sup> described above in connection with Figures 1, 2, and 3. The feeding wheel 16<sup>a</sup> is rotated through a rotatable member similar to member 22 of Figure 1.

35 Another form of toggle link connection between the actuating lever and the slide is illustrated in Figures 7, 8 and 9. In this form the link 64 has a circular end 65 which engages in circular holes 66 in the two plates 40 of the slide, similarly to the holes 56 of Figure 5. As shown in Figures 7 and 8 the bottom plate 33<sup>b</sup> of the slide has a raised bridge of metal 58' and the plate 32<sup>b</sup> has a tapered slot 57', corresponding to the strap or bridge 45 58 and the slot 57' of Figures 4 and 5.

The other end of the link has pivotal connection through a pin 68 with the end of the actuating lever 46<sup>b</sup>. As shown in Figure 9, the end portion of the shank 12<sup>b</sup> to which the lever 46<sup>b</sup> is pivoted is raised as indicated at 69. This enables the link 64 to be pivoted to the outer side of the actuating lever 46<sup>b</sup> and allows this link to reciprocate in the plane of the slide. The outer end of the lever 46<sup>b</sup> is dropped as indicated at 71 so that it will engage the side edge of the shank 12<sup>b</sup> for preventing the actuating handle from swinging past the position illustrated in Figure 8.

This embodiment also has the same general arrangement of serrated feeding wheel 16<sup>b</sup>, cutting disc 35<sup>b</sup> and backing disc 36<sup>b</sup>, illustrated in Figures 1 and 2. In this embodiment the positive pivotal connection between the link 64 and the actuating lever 46<sup>b</sup> is operative to positively retract the slide upon

outward swinging movement of the actuating lever, without the necessity of providing a shoulder 44 to be engaged by the lever.

I claim:

1. In a can opener, the combination of a shank, a feeding wheel pivotally supported adjacent one end of said shank, means for rotating said feeding wheel, a slide mounted on said shank, means for moving said slide towards and away from said feeding wheel, a pivot carried by said slide, a cutting disc on said slide, and an independently rotatable backing wheel on said pivot.

2. In a can opener, the combination of a shank, a feeding wheel pivotally supported adjacent one end of said shank, means for rotating said feeding wheel, a slide mounted on said shank, means for moving said slide towards and away from said feeding wheel, a pivot carried by said slide, a cutting disc on said slide, and an independently rotatable backing wheel on said pivot substantially in the plane of said feeding wheel.

3. In a can opener, the combination of a shank, a serrated feeding wheel pivotally supported adjacent one end of said shank, rotating means projecting upwardly from said shank for rotating said feeding wheel, a slide mounted on said shank comprising upper and lower plates, said plates being spaced at their front ends, a pivot supported between said spaced ends, a cutting wheel on said pivot, and a backing wheel on said pivot for engaging the outer side of said can substantially opposite the point of contact of said feeding wheel.

4. In a can opener, the combination of a shank, a serrated feeding wheel pivotally supported adjacent one end of said shank, means for rotating said feeding wheel, a slide mounted on said shank comprising upper and lower plates, the front end of said lower plate being spaced from said upper plate, a pivot supported between said spaced ends, a cutting disc on said pivot, an independently rotatable backing wheel on said pivot disposed substantially in the plane of said feeding wheel, and lever means for moving said slide along said shank.

5. In a can opener, the combination of a shank, a serrated feeding wheel pivotally supported adjacent one end of said shank, means for rotating said feeding wheel, a slide mounted on said shank comprising upper and lower plates, said plates being spaced at their front ends, a pivot supported between said spaced ends, said shank having a slot therein through which said pivot extends, a cutting disc on said pivot, an independently rotatable backing wheel on said pivot disposed substantially in the plane of said feeding wheel, a lever pivoted to said shank for actuating said slide, and guide means extending from said lower plate and

engaging over said shank for guiding the movement of said slide.

6. In a can opener, the combination of a shank, a feeding wheel pivotally supported adjacent one end of said shank, means for rotating said feeding wheel, a slide mounted on said shank comprising inner and outer plates, said plates being spaced at their front ends, a pivot supported between said spaced ends, said shank having a slot therein, said pivot extending through said slot, a flange on the upper end of said pivot overlying the edges of said slot, a cutting disc on said pivot, a backing wheel on said pivot rotatable independently of said cutting disc and disposed substantially in the plane of said feeding wheel, guide flanges extending from said outer plate past the lateral edges of said inner plate and engaging over the upper side of said shank, and a lever pivotally mounted on said shank for reciprocating said slide.

7. In a can opener, the combination of a shank, a feeding wheel pivotally supported adjacent one end of said shank, means for rotating said feeding wheel, a slide mounted on said shank, the front end of said slide comprising two spaced portions, a pivot extending transversely through said spaced portions, a cutting disc on said pivot between said spaced portions, a backing wheel on said pivot between said spaced portions, guide means on said slide engaging over the opposite side of said shank, and a lever pivoted to said shank for reciprocating said slide.

8. In a can opener, the combination of a shank, a feeding wheel pivotally supported adjacent one end of said shank, means for rotating said feeding wheel, a slide mounted on said shank, said slide comprising an upper pivot supporting portion disposed adjacent the under side of said shank and a lower pivot supporting portion spaced from said upper portion, both of said pivot supporting portions lying in planes substantially parallel to said shank, a pivot extending between said pivot supporting portions, a cutting disc on said pivot between said pivot supporting portions, a backing wheel on said pivot between said pivot supporting portions, and lever means pivotally mounted on said shank for moving said slide along said shank.

9. In a can opener, the combination of a shank having a raised portion at its front end, a feeding wheel pivotally supported on said raised portion, a rotatable thumb member connected to said feeding wheel above said raised portion for rotating said feeding wheel, a slide on said shank comprising separate upper and lower plates, said lower plate having its front end dropped for providing a space between the front end of said plates, a pivot extending through apertures in said plates, said shank having a slot therein, said pivot extending through said slot, a

flange on the upper end of said pivot overlying the edges of said slot, a cutting disc on said pivot between said plates, an independently rotatable backing wheel on said pivot between said plates and substantially in the plane of said feeding wheel, flanges extending from said lower plate up along the sides of said upper plate and over the upper side of said shank, a shoulder depending from one of said flanges, and a lever pivotally connected to said shank having a sloped face adapted to engage the ends of both of said plates for moving the slide forwardly and adapted to engage the depending shoulder for moving the slide backwardly.

10. In a can opener, the combination of a shank, a feeding wheel pivotally supported adjacent one end of said shank, means for rotating said feeding wheel, a slide mounted on said shank, said slide having a rear pressure surface, a cutting disc pivotally supported on said slide, a backing wheel pivotally supported on said slide, and a camming lever pivotally mounted on said shank and having a cam surface on its end adapted to engage the rear pressure surface of said slide, the cam surface of said lever being inclined to present said cam surface and said pressure surface in flush contact while said lever is inclined at an angle to said shank.

11. In a can opener, a frame, a lever fulcrumed on said frame and cams on said lever, a shaft and a wheel on said shaft rotatably mounted in said frame, in combination with an additional frame movably mounted on said first named frame, a cutting wheel and a roller rotatably mounted on said additional frame, a guard to said cutting wheel on said additional frame, said lever and cams arranged to force said cutting wheel and roller into determined and co-acting relation with said first named wheel.

12. In a can opener, a shank, a serrated feeding wheel rotatably supported adjacent one end of the shank, a handle connected with said feeding wheel for rotating the latter, a longitudinal slot formed in said shank adjacent said feeding wheel, a cutting disc, a stem whereon said cutting disc is mounted, said stem extending through said slot, means associated with said stem engaging opposite faces of the shank to prevent withdrawal of the stem from the slot while permitting reciprocation of the stem in the slot, and a cam-lever pivoted to said shank adapted when squeezed toward said shank to move said stem in said slot to cause the cutting disc to approach the feeding wheel.

In witness whereof, I hereunto subscribe my name this 17th day of March, 1925.

ALBERT C. GRUNWALD.