April 15, 1952 R. E. McLEAN 2,592,935

CAN OPENER

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FIG. 1.

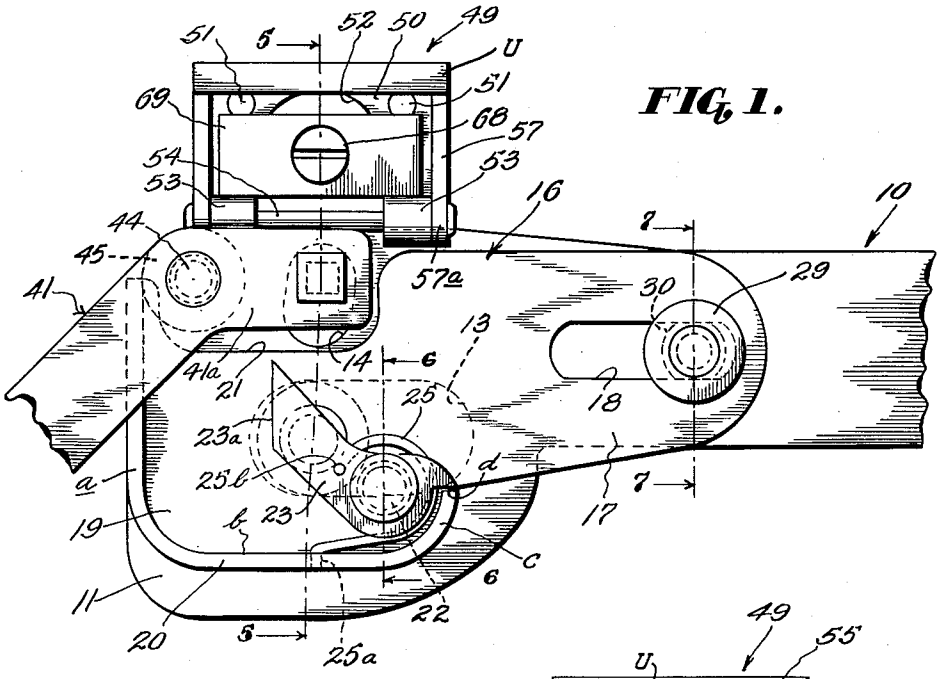
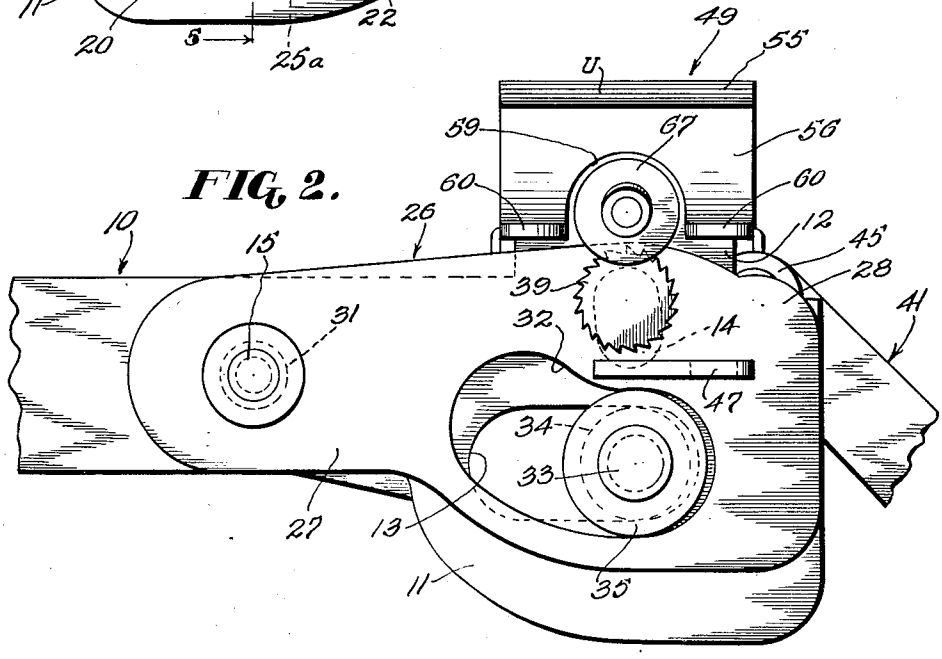


FIG. 2.



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CAN OPENER

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FIG. 3.

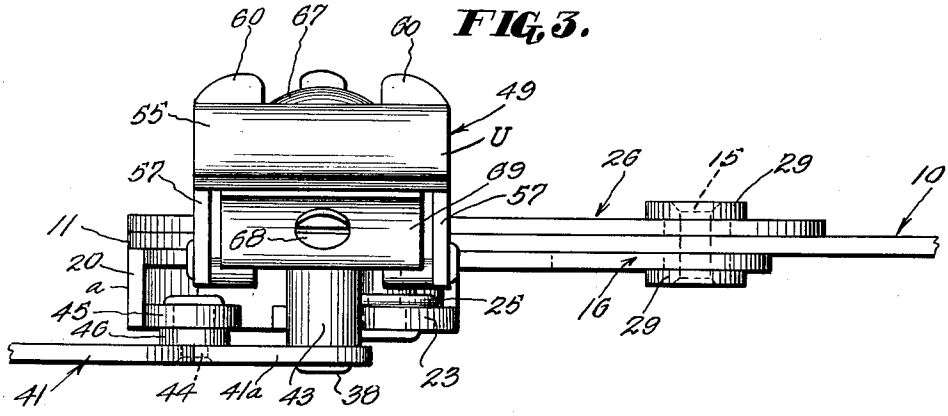


FIG. 4.

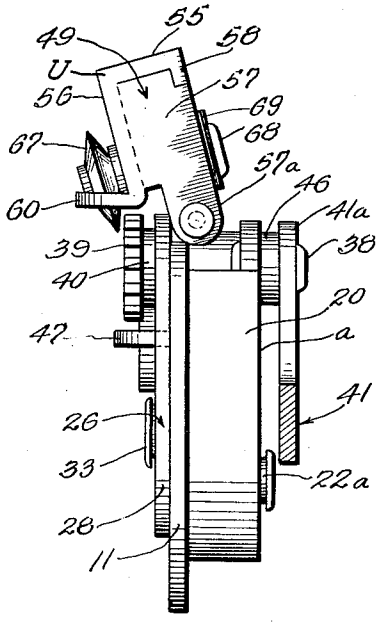


FIG. 5.

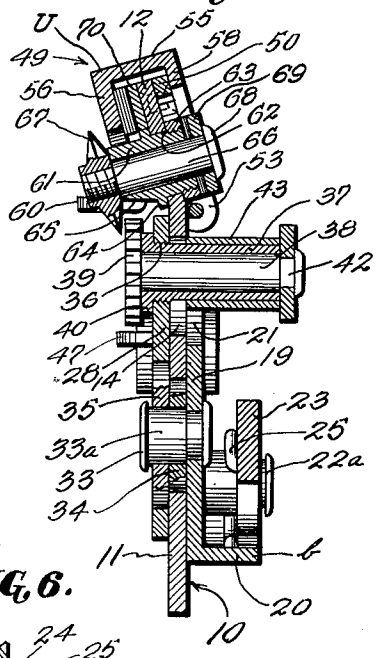


FIG. 6.

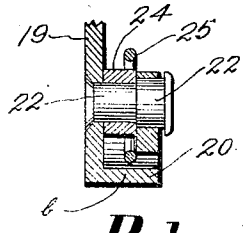
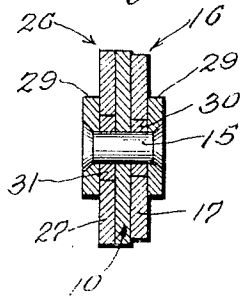


FIG. 7.



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FIG. 8.

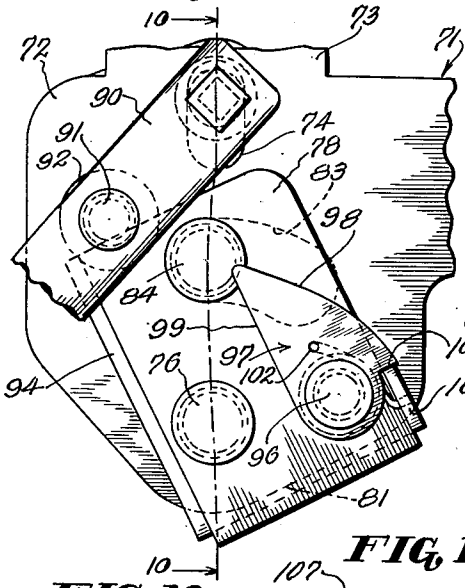


FIG. 9.

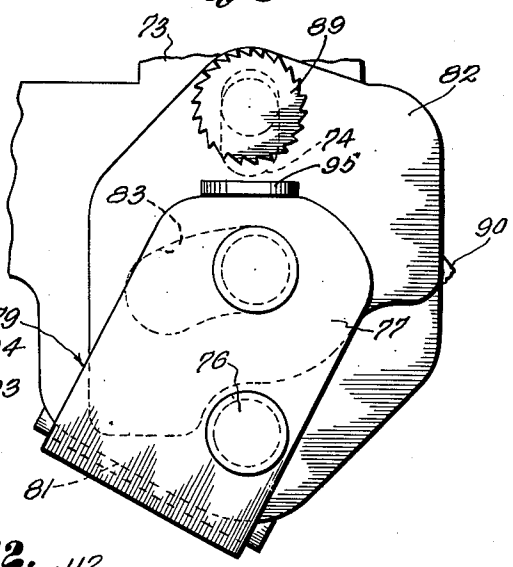


FIG. 10.

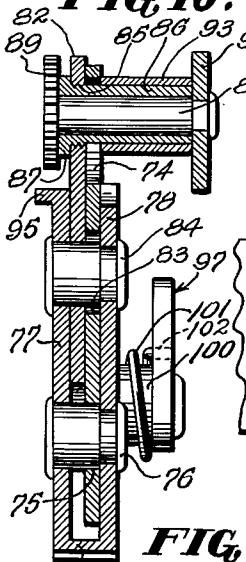


FIG. 12.

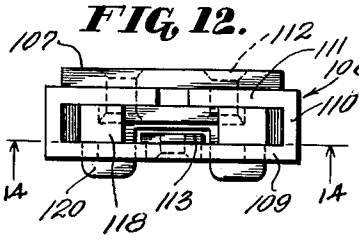


FIG. 11.

FIG. 14.

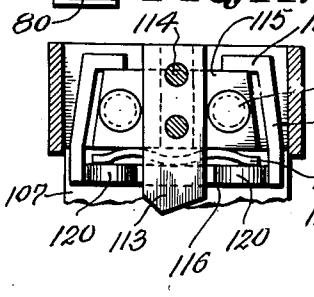
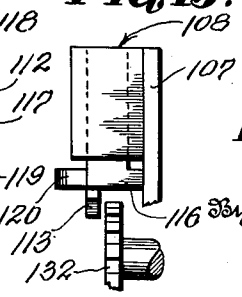


FIG. 13.



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FIG. 15.

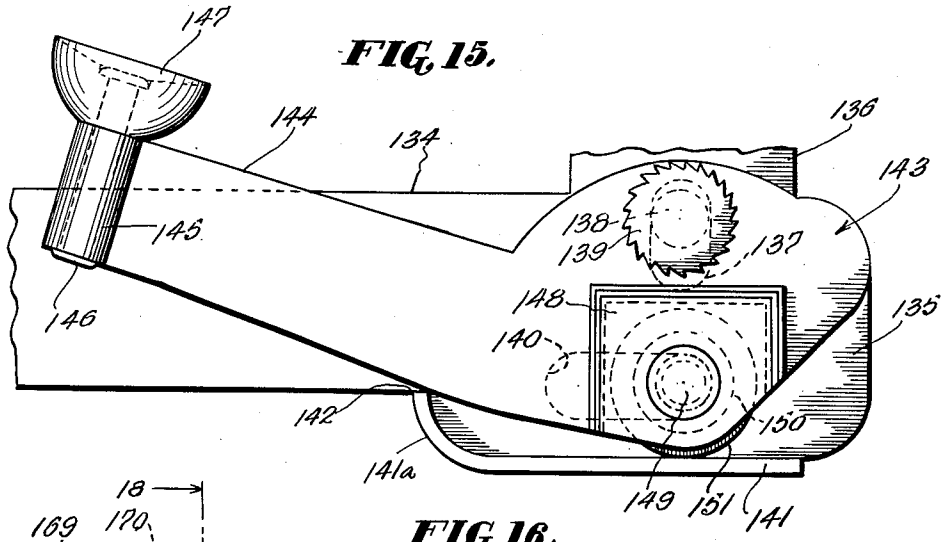


FIG. 16.

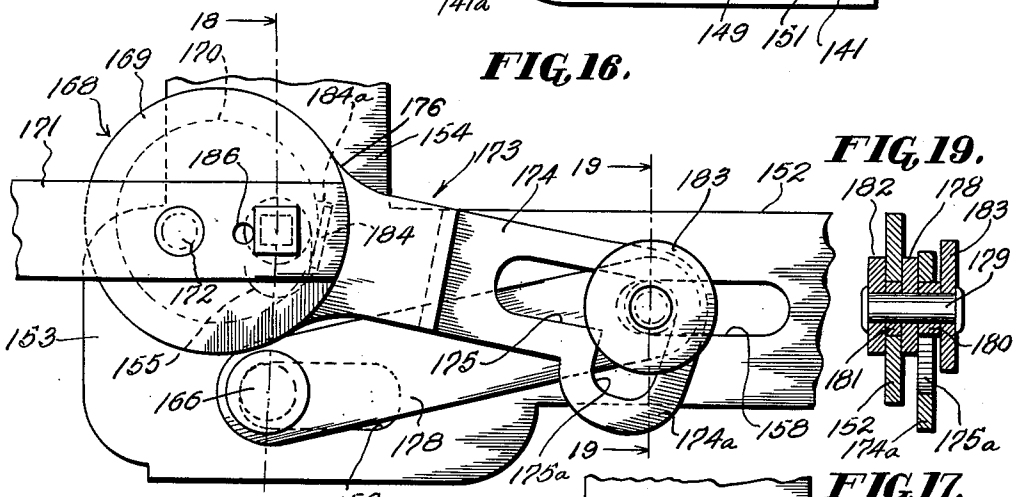


FIG. 19.

FIG. 17.

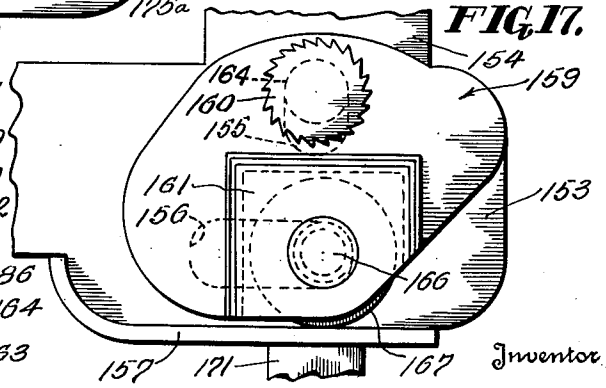
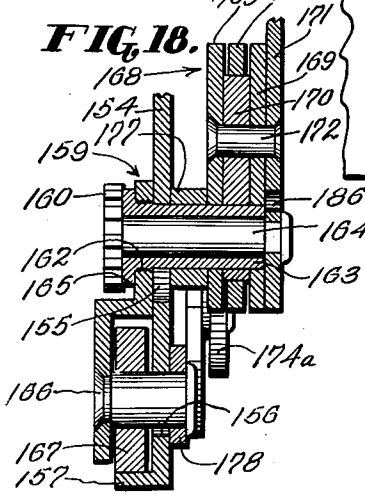


FIG. 18.



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FIG. 20.

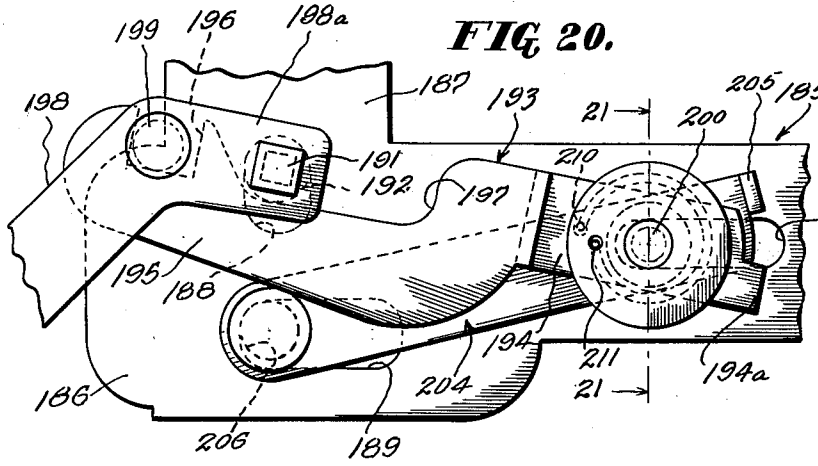


FIG. 21.

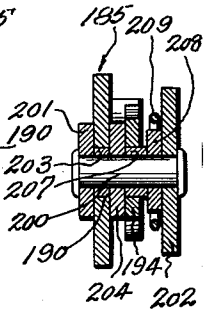


FIG. 22.

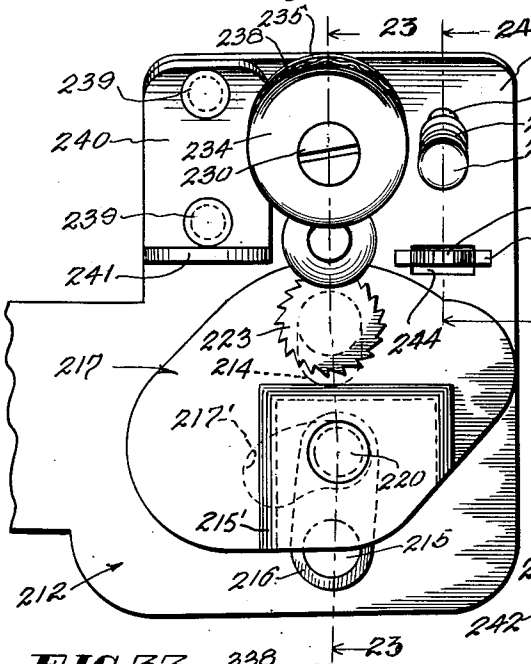


FIG. 23.

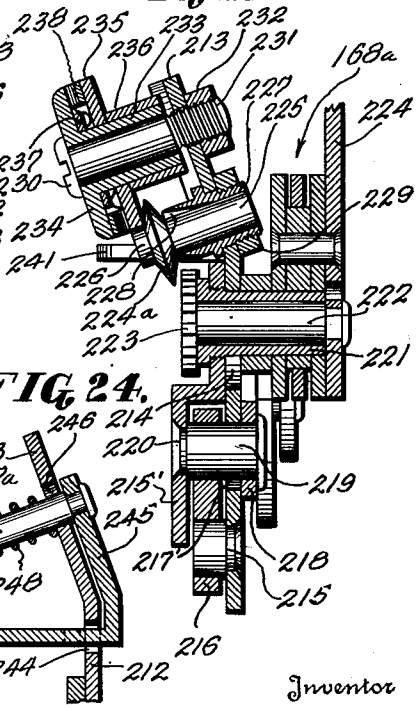


FIG. 24.

FIG. 33.

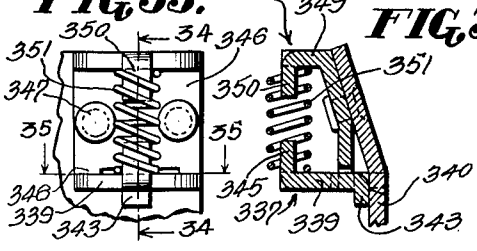


FIG. 34.

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FIG. 25.

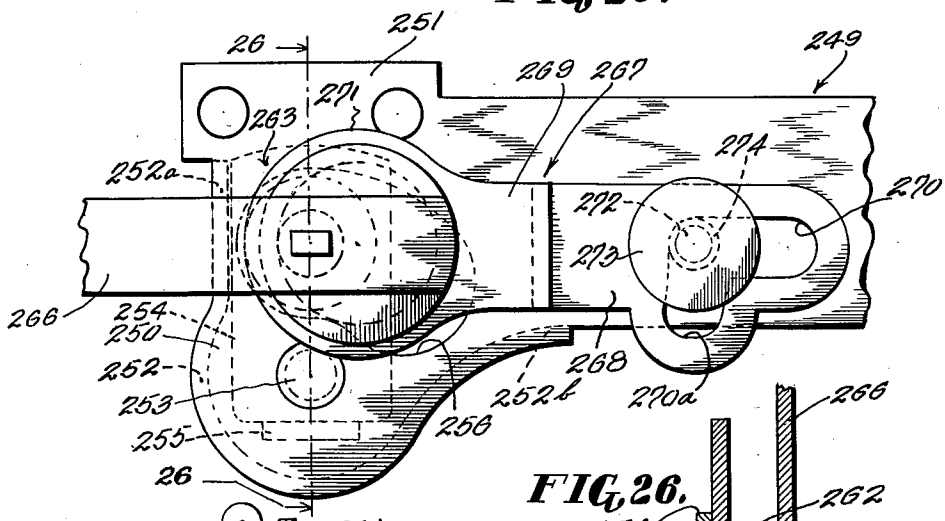


FIG. 26.

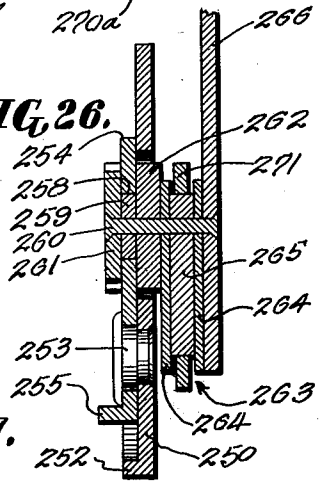


FIG. 28

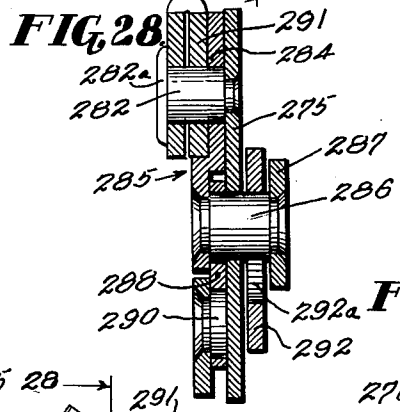
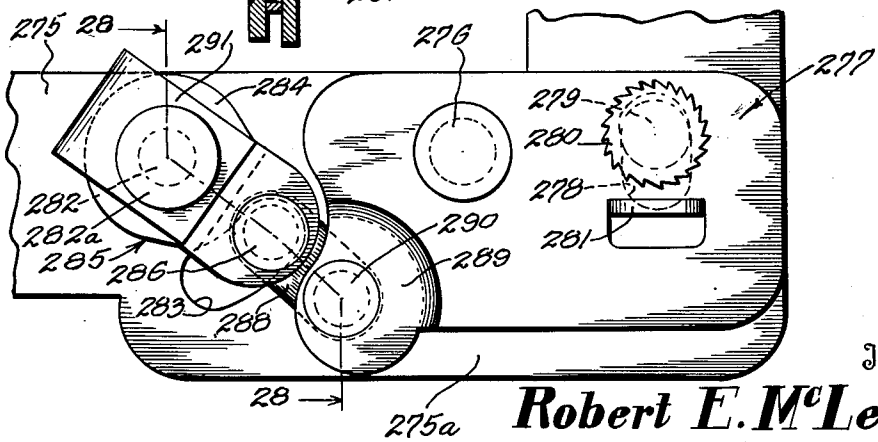


FIG. 27.



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FIG. 29.

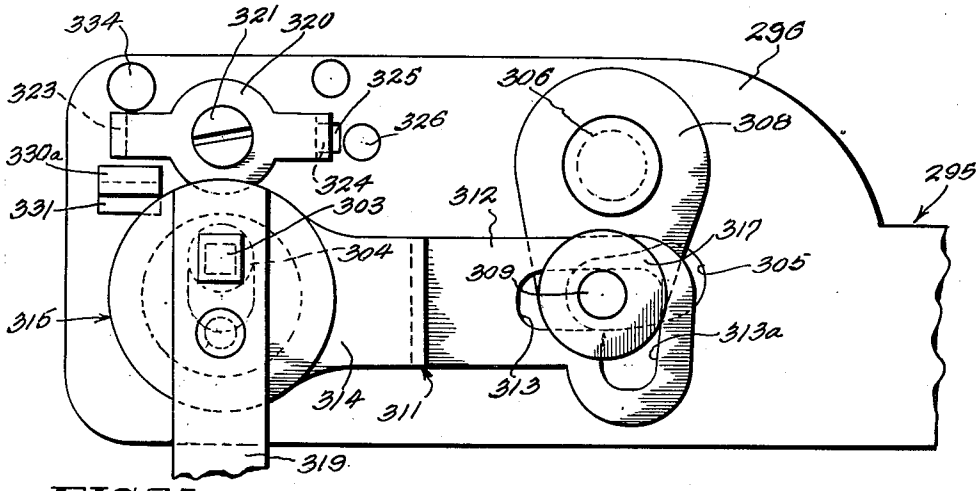


FIG. 35.

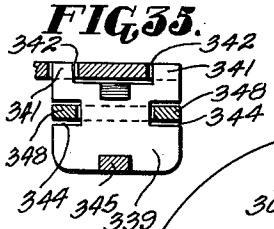


FIG. 30.

FIG. 31.

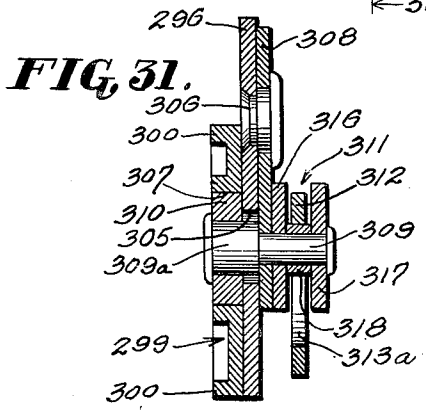
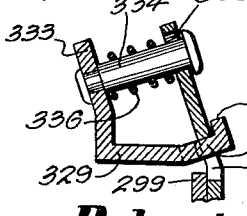


FIG. 32.



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FIG. 36.

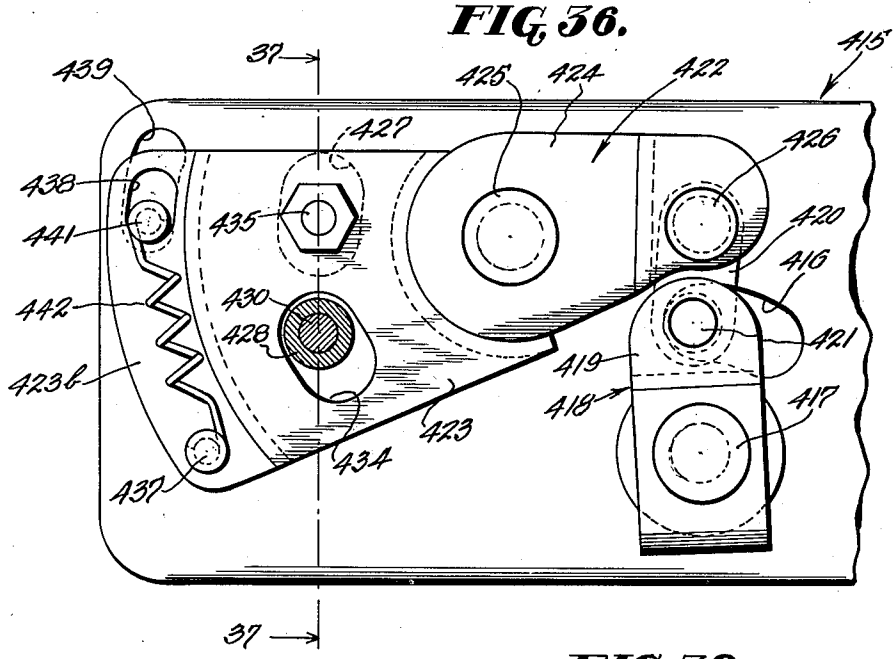


FIG. 37.

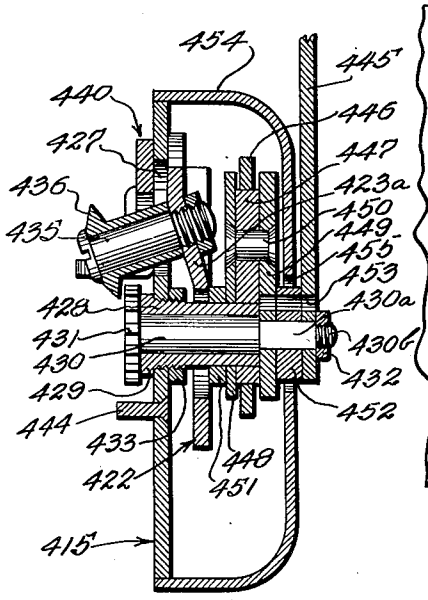
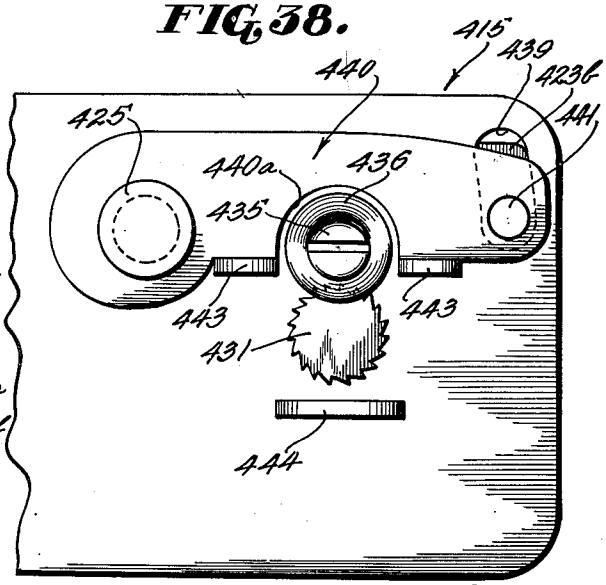


FIG. 38.



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FIG. 39.

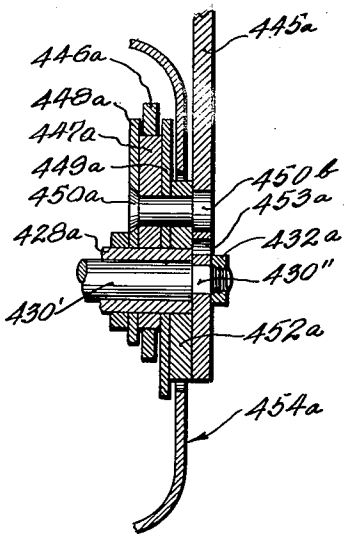


FIG. 40.

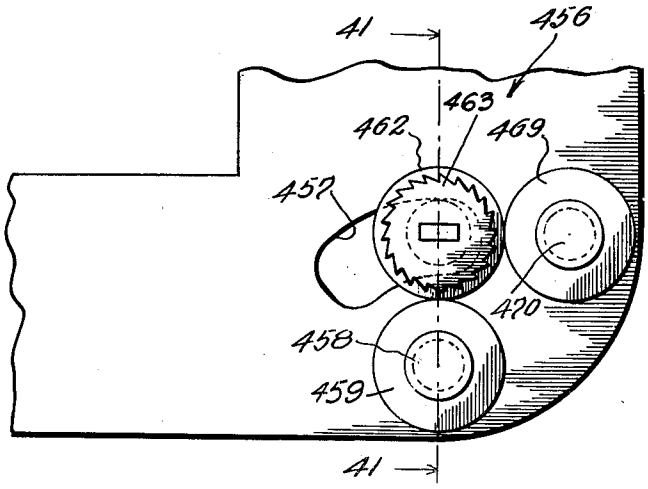


FIG. 42.

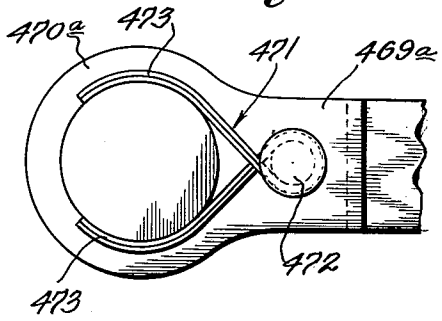


FIG. 41.

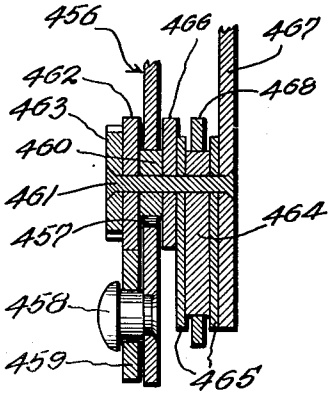
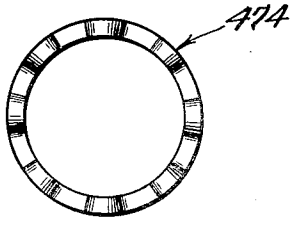


FIG. 43.



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Patented Apr. 15, 1952

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UNITED STATES PATENT OFFICE

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CAN OPENER

Robert E. McLean, Columbus, Ga., assignor to John C. Hockery, Kansas City, Mo., as trustee

Application April 28, 1947, Serial No. 744,393

22 Claims. (Cl. 30—9)

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This invention relates to improvements in can opening devices and is directed particularly to an improved can opener of the rotary drive wheel type.

A principal object of the present invention is to provide a can opener of the rotary drive wheel type and employing a single operating handle, which is constructed in a novel manner whereby clockwise rotation of the handle causes the device to puncture the end of the can, secure and hold the can in proper position for the cutting out of the head thereof and the cutting out of the can head or end, and subsequent counterclockwise rotation of the said single operating handle effects the separation of can holding parts to release the can for removal, a particular novel feature of the device as set forth in its several embodiments in the present application, residing in an improved mechanism whereby shifting of the can relative to the cutter is effected with ease and smoothness by reason of novel leverage or thrust means.

Another object of the invention is to provide a can opener of the rotary drive wheel type wherein the stated thrust or leverage mechanism is so designed that the stated puncturing of the can head is not only effected with ease and smoothness but the parts become firmly secured in working position whereby the can is maintained in proper position to have the head cut therefrom, without danger of being released and dropped.

Still another object of the invention is to provide in a can opener of the rotary drive wheel type, a novel resilient can rest designed for use in association either with a rotatable disk cutter or with a cutter of the fixed blade type, which maintains the can in good alignment while installed in the device and exerts downward resilient pressure against the top edge of the can, regardless of the height of the rim of the can, whereby to assure adequate traction of the teeth of the can rim engaging driving wheel with the under edge of the same rim of the can.

Still another object of the invention is to provide a can opener of the rotary drive wheel type wherein the stated thrust mechanism is designed in a novel manner to be exceptionally substantial and durable in order that it will continue to operate efficiently over a long period or after prolonged use.

A still further object of the invention is to provide a can opener of the rotary drive wheel type employing a single operating handle functioning as hereinbefore described, wherein novel means

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is provided for the escape of such handle from thrust operating mechanism, smoothly and without additional effort on the part of the operator of the device, such as might be required in connection with or to effect the tripping of trigger mechanism.

Still another object of the invention is to provide in a can opener of the rotary drive wheel type, rotatable shafts for a can rim engaging driving wheel and a disk cutter, which are of comparatively great length and provided with bearings of corresponding length to provide greater ease of operation, continued good alignment of operating parts even after prolonged use, and a minimum of wear.

Other objects and advantages of the invention will become apparent as the description of the same proceeds and the invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming a part of the specification, with the understanding, however, that the invention is not to be understood as limited to the exact details of construction shown and described since obvious modifications will occur to a person skilled in the art.

In the drawings:

Figure 1 is a view in elevation of the right hand side of a can opener constructed in accordance with one embodiment of the present invention, a portion of the operating handle therefor being broken away.

Figure 2 is a view in elevation of the opposite or left hand side of the same.

Figure 3 is a view in top plan of the same.

Figure 4 is a view of said one embodiment in front elevation.

Figure 5 is a vertical section taken substantially on the line 5—5 of Figure 1.

Figure 6 is a vertical section taken substantially on the line 6—6 of Figure 1.

Figure 7 is a section taken substantially on the line 7—7 of Figure 1.

Figure 8 is a view in elevation of the right hand side of a second embodiment of the invention, portions thereof, such as the handle and cutter carrying head being broken away.

Figure 9 is a view in elevation of the left hand side of the second embodiment.

Figure 10 is a vertical section taken substantially on the line 10—10 of Figure 8.

Figure 11 is a view in elevation of the left hand side of a slightly modified form of the first embodiment.

Figure 12 is a view in top plan of the cutter head shown in Figure 11.

Figure 13 is a view in front elevation of the cutter head showing adjacent thereto a portion of the can rim engaging driving wheel.

Figure 14 is a sectional view taken substantially on the line 14—14 of Figure 12.

Figure 15 is a view in elevation of the left hand side of a third embodiment, the cutter supporting head portion being broken away.

Figure 16 is a view in elevation of the right hand side of a fourth embodiment, the cutter head and a portion of the operating handle or crank being broken away.

Figure 17 is a view in elevation of the left hand side of the opener shown in Figure 16.

Figure 18 is a vertical section taken substantially on the line 18—18 of Figure 16.

Figure 19 is a vertical section taken substantially on the line 19—19 of Figure 16.

Figure 20 is a view in elevation of the right hand side of a fifth embodiment, a portion of the handle and the cutter supporting head being broken away.

Figure 21 is a sectional view taken on the line 21—21 of Figure 20.

Figure 22 is a view in elevation of the left hand side of a modified form of the fourth embodiment.

Figure 23 is a vertical section taken substantially on the line 23—23 of Figure 22.

Figure 24 is a sectional view taken substantially on the line 24—24 of Figure 22.

Figure 25 is a view in side elevation of the right hand side of a sixth embodiment, a portion of the handle being broken away.

Figure 26 is a sectional view taken substantially on the line 26—26 of Figure 25.

Figure 27 is a view in elevation of the left hand side of a seventh embodiment.

Figure 28 is a sectional view taken substantially on the line 28—28 of Figure 27.

Figure 29 is a view in elevation of the right hand side of an eighth embodiment, a portion of the handle being broken away.

Figure 30 is a view in elevation of the left hand side of the eighth embodiment.

Figure 31 is a vertical transverse section taken on the line 31—31 of Figure 30.

Figure 32 is a sectional view taken on the line 32—32 of Figure 30.

Figure 33 is a view of the left hand side of another form of resilient can rest.

Figure 34 is a sectional view taken on the line 34—34 of Figure 33.

Figure 35 is a horizontal section taken on the line 35—35 of Figure 33.

Figure 36 is a view of the right hand side of a ninth embodiment of a can opener constructed in accordance with the present invention, the cover or housing for the mechanism being removed together with the eccentric thrust mechanism.

Figure 37 is a section taken substantially on the line 37—37 of Figure 36 showing in section parts which are removed from the structure as illustrated in Figure 36.

Figure 38 is a view in elevation of the inner or left hand side of the ninth embodiment.

Figure 39 is a vertical section corresponding to a portion of Figure 37 and showing an alternate construction of the eccentric thrust mechanism and the enclosing housing or cover.

Figure 40 is a view in elevation of the inner

or left hand side of a tenth embodiment of the invention.

Figure 41 is a vertical section taken substantially on the line 41—41 of Figure 40.

Figure 42 is a view of the right hand side of a portion of the eccentric thrust link showing the adaptation of an alternate type of friction spring which may be used in lieu of the spring 184 shown in Figure 16.

Figure 43 is a plan view of a circular corrugated spring which is a second alternate type friction spring and which can be used in lieu of spring 184 or the spring shown in Figure 42.

Referring now more particularly to the drawings the numeral 10 designates in Figures 1 to 5 inclusive a supporting arm which is designed to be mounted in horizontal position upon a wall or other suitable supporting structure by any suitable type of supporting means, not shown.

The forward end of the bracket arm 10 is integral with the body plate 11, a portion of the top edge of which is extended upwardly as indicated at 12. As shown in Figure 5, this extension 12 is inclined slightly from the plane of the body 11 toward the left or inner side of the body plate and supports the hereinafter described cutter head and resilient can rest.

The lower part of the body plate 11 has formed therein the horizontal guide opening or slot 13 and above this slot there is formed in the body plate the slightly arcuate vertically extending slot 14 the radius of which is struck from the center of an aperture formed in the arm 10 for a pivot rivet 15 which is set a substantial distance rearwardly from the body plate 11 as shown.

Disposed against the right hand side of the body plate 11 and arm 10, is a shiftable plate which is generally designated 16 and which in this embodiment shifts by reciprocable or sliding movement. This shiftable plate has a rearwardly extending portion 17 which is provided with a relatively long longitudinally extending or horizontal slot 18, and a forward portion 19 which has the forward edge, the bottom edge and part of a rear edge thereof bordered by the continuous laterally extending flange 20, the parts thereof which outline the three mentioned edges, being designated *a*, *b* and *c*. The portion *c* of the flange 20 curves upwardly and the top edge thereof designated *d* functions as a stop for a portion of the mechanism as hereinafter described.

The forward portion 19 of the plate 16 has a relatively long recess 21 formed in the top edge thereof for the purpose hereinafter described and as shown in Figure 1, the arcuate body plate opening or slot 14 opens across the top edge of this recess 21.

Secured to the forward portion 19 of the plate 16 adjacent to the upwardly curving portion *c* of the flange 20, is a rivet 22 on the outer end portion 22*a* of which is oscillatably mounted the relatively long pawl 23. The portion 22*a* of the rivet 22 is of slightly larger diameter than the portion which is directly attached to the part 19, as shown in Figure 6, and this portion of smaller diameter has thereon the spacer sleeve 24 which maintains the pawl in spaced relation with the adjacent part 19 of the slide. The pawl 23 has the end remote from the pivot 22 cut obliquely to its length whereby there is provided a contact or strike face 23*a* for the purpose hereinafter described.

Encircling the spacer sleeve 24 is a spring 25, one end of which is fixed in the adjacent bottom

portion *b* of the flange 20 as shown at 25*a* while the other end of the spring is fixed as at 25*b* to the pawl. This spring, which is looped around the spacer 24, is biased so as to constantly tend to swing or turn the pawl clockwise. Thus the strike face 23*a* of the pawl will be at substantially all times directed forwardly.

Upon the left hand side of the body plate 11, or opposite from the shiftable plate 16, is a rock plate generally designated 26 and which corresponds in general form to the plate 16 and comprises the rotary drive wheel carrying plate. This plate 26 comprises a rear portion 27 and a larger front portion 28. The rear portion is pivotally supported upon the pivot 15 and this pivot has upon its two ends the retaining washers 29 which bear against the adjacent portions 17 and 27 of the plates to maintain the latter in position.

Encircling the pivot rivet in the plane of the plate portion 17, is a journal 30 which lies within the slot 18 and has upper and lower flat surfaces for sliding contact with the parallel edges of the slot. On the opposite side of the arm 10 the rivet 15 is encircled by a corresponding journal 31 which, however, is completely circular and forms a bearing for the portion 27 of the plate 26.

The forward larger end of the plate 26 has formed therein the arcuate cam slot 32. The lower end of this slot which is substantially horizontally directed, lies beneath the slot 18 and the cam slot 32 extends upwardly and rearwardly as shown in Figure 2.

Secured to the shiftable plate portion 19 is the pivot rivet 33 which, as shown in Figure 5, has an enlarged portion 33*a* which extends through the body plate slot 13 and the cam slot 32, toward the inner or left side of the device. This rivet carries upon the enlarged portion 33*a*, the two rollers 34 and 35 which, as shown are of different diameters, the roller of smaller diameter, designated 34, lying in the body plate slot 13 while the larger roller 35 is positioned in the cam slot 32.

Passing through and secured by screw threads as shown in Figure 5 at 36, in the drive wheel carrying rock plate 26, is a tubular bearing 37 of substantial length, which extends to the right a considerable distance beyond the outer side of the shiftable plate 16. This tubular bearing lies in the recess 21 in the top edge of the forward part 19 of the plate 16 and it has extending therethrough and rotatable therein the shaft 30, upon the inner end of which is secured the peripherally toothed can rim engaging driving wheel 39. Between the forward part 28 of the plate 26 in which the bearing 37 is mounted, and the wheel 39, the end of the bearing is formed to provide the encircling spacing collar 40 which maintains the drive wheel 39 at the desired position in relation to the adjacent face of the plate 26 by which it is carried.

It will also be seen that the bearing 37 extends through the arcuate slot 14 of the body plate 11 so that upon up and down movement of the plate 26 the bearing, shaft and wheel will be raised and lowered within the limits of the slot 14.

The numeral 41 designates a handle or crank, the outer end of which is broken away but which in practice is provided with a knob or other suitable means to facilitate grasping the handle for operation. At the inner and attached end of the handle a portion thereof is angularly directed as indicated at 41*a* and the end of this angularly directed portion is secured to the right hand or outer end of the shaft 38 as indicated at 42. Between the portion 41*a* of the handle and the body plate, is a spacer sleeve 43 which encircles the tubular bearing 37.

At the end of the angular portion 41*a* where it joins the main part of the handle, the handle carries a pivot rivet 44 upon which is rotatably mounted the cam roller 45. This cam roller is maintained in the proper position with respect to the handle, for contact with the adjacent surface of the portion *a* of the flange 20, by a spacer sleeve 46 which encircles the rivet 44 as shown in Figure 3.

Secured to the driving wheel supporting plate or arm 26, below and slightly forwardly of the driving wheel, is a can guard 47 which maintains the can a predetermined distance from the lower face or lateral surface of the can driving wheel 39.

The numeral 49 generally designates the can rest which lies above and is supported by the angularly directed portion 12 of the body plate 11. This can rest structure comprises a plate 50 which is disposed against the outer or right hand side of the body plate portion 12 and is secured thereto by rivets 51. The central part of the plate 50 is cut out from the lower edge as indicated at 52 in Figure 1, forming side portions which at their lower ends are turned or rolled to provide hinge pintle sleeves or knuckles 53. Extending transversely of the portion 12 and passing through these sleeves or knuckles 53 is the pintle 54.

In addition to the fixed plate 50, the can rest 49 includes a box-like unit, generally designated "U" which encloses the upper end of the body plate portion 12 and the attached plate 50 and which comprises a top portion 55, the inner depending portion 56 and the front and rear end portions 57. The latter portions extend downwardly to provide the hinge ears 57*a* which position against the remote ends of the hinge sleeves 53 and are apertured to receive the adjacent ends of the pintle 54 as most clearly shown in Figure 1. A downturned flange 58 upon the right or outer side of the box-like unit "U", engages the outer side of the fixed plate portion 50, as shown in Figure 5, to limit the inner swinging movement of this portion.

The inner side 56 of the can rest unit "U" is cut out from the lower edge as indicated at 59 in Figure 2 and portions of the lower edge of this side, at opposite sides of the cut out part, are turned to provide the forward and rearward feet 60 of the can rest which, as shown in Figure 4, are normally substantially horizontal even though the side 56 of the can rest structure of which they form a part, is inclined to the left or to the inner side.

The numeral 61 designates a tubular bearing, one end of which is threadably secured in a suitable opening as indicated at 62 in the body plate portion 12, and has secured thereon the nut 63 which bears against the outer side of the body plate portion 12 as shown in Figure 5. Upon the inner side of this portion 12 the tubular bearing 61 has a flange 64 which is drawn against the body plate portion 12 by the nut 63 as shown.

The underside of the tubular bearing 61 is cut away or flattened as indicated at 65 and has a flat substantially horizontal surface opposed to and parallel with the top of the toothed periphery of the can driving wheel 39. The cutting away of this bearing prevents the can rim from contacting the bearing.

The bearing sleeve 61 has extended there-

through the arbor 66 upon which is secured, upon the end of the arbor disposed adjacent to the driving wheel 39, the disk cutter 67.

The end of the arbor 66 remote from the cutter 67, has a head 68 and interposed between this head 68 and the plate 50 is a bow spring 69, the opposite ends of which bear against the side portions of the plate 50 as shown in Figure 1. Thus while the cutter wheel 67 together with its supporting arbor 66 is permitted axial movement, the tendency of the spring 69 is to constantly draw the cutter back to a position where its cutting edge is in close proximity to the inner face of the driving wheel 39, as shown in Figure 5.

A second spring which is designated 70 is interposed between the inner depending portion 56 of the rest and the inner face of the extended top portion 12 of th body plate 11. Thus it will be seen that in addition to the fact that the cutter 67 has axial movement against the tension of the spring 69, the pivoted unit "U" of the can rest 49 also has movement in the opposite direction against the action of the spring 70. With this arrangement it will be readily seen that when a can is having the top or head cut therefrom, if any seam or other thickened portion of the cam body is required to pass between the cutter and the adjacent face of the wheel 39 the parts will shift sufficiently to permit such passage without jamming the can between the cutter and wheel and without straining any of the parts of the device.

In the operation of this first embodiment, if the shiftable thrust plate 16 is not in the extreme rearward position, the operating handle 41 is rotated counterclockwise until it is in such position. Such counterclockwise rotation brings the cam roller 45 into contact with the strike face 23*a* of the pawl 23 thereby forcing the plate 16 rearwardly on the journal 30. Such rearward movement of the plate 16 carries with it the pivot 33 and the rollers 34 and 35. This moves the roller 35 in the cam slot 32 so as to effect the lowering of the plate 26 and consequently the lowering of the can rim engaging driving wheel 39.

When not in use the shiftable member 16 will ordinarily be in its rearwardmost position and the operating handle 41 will be in a depending position with the knob thereof, not shown, rearward of the section line 5—5 of Figure 1, which is an out of the way position. When in such position the roller 34 will be in the rearward end of its cammed slot 13; the roller 35 will be in the rearward end of its cammed slot 32, and the can driving wheel 39 will be in its lowered position as previously stated.

The can is then inserted in the device by holding it in such manner that its upper end is against the cutting edge of the disk cutter 67. The operating handle is then rotated clockwise until the end is cut out of the can. During approximately the first quarter turn of the operating handle, the roller 45 engages the outturned portion *a* of the flange 20 and moves the slide member forwardly to approximately the position illustrated in Figures 1 to 5 inclusive. During such movement, the rollers 34 and 35 move the forward end of the oscillatable can driving wheel supporting arm or plate 26 upwardly to approximately the position illustrated in Figures 1 to 5. During such movement the can driving wheel 39, being under the rim or flange of the can, moves the can upwardly in such manner that the disk cutter punctures the end of the can and the rim of the can lifts the feet 60 of the overlying can rest 49, slightly against the tension of the spring 70, the can rest 49 oscillating slightly on the pivot pintle 54. The can rest 49 prevents the can from tilting while it is installed in the device. Further clockwise rotation of the operating handle 41 causes the can driving wheel to feed the can through the device in such manner that the disk cutter 67 rotates and cuts the end out of the can, at which time the operating handle 41 is turned counterclockwise to release the can from the device.

The tension of the bow spring 69 is such as to normally maintain the disk cutter in desired lateral relation to the face of the can driving wheel during operation of the device, but permits the disk cutter to be forced laterally away from the face of the can driving wheel as previously explained.

During clockwise rotation of the operating handle 41 the roller 45 contacts the pawl 23 and oscillates the pawl out of its path, against the tension of the spring 25, the spring immediately reacting to move the pawl back to its initial position so that upon counterclockwise rotation of the handle the roller 45 will engage the strike face 23*a* of the pawl as previously explained.

A second embodiment of the invention is illustrated in Figures 8 to 10 inclusive. In the illustration of this embodiment the numeral 71 designates a portion of the supporting arm for the body plate which is generally designated 72. At the top of the body plate 72 is an upwardly extending portion 73 which is designed to support the cutter and associate parts such, for example, as the cutter and can rest structure as shown in Figures 1 to 5 inclusive. It is thought that the arrangement of these parts with respect to the hereinafter described can rim engaging driving wheel and thrust mechanism will be readily apparent so that an illustration and description of such cutter and can rest parts is not necessary.

The body plate 72 has formed in the upper part thereof adjacent to the extension 73, the elliptical slot 74, the long axis of which is vertically directed. Below this slot and adjacent to the lower end of the body plate is an aperture 75 in which is rotatably engaged a portion of a pivot rivet 76.

The lower part of the body plate 72 is disposed between the spaced parallel inner and outer side portions 77 and 78 respectively of a shiftable member in the form of a yoke which is generally designated 79. The lower edges of this yoke 79 are joined by the narrow web 80 which lies beneath the bottom edge of the body plate 72. Such bottom edge of the body plate is cut obliquely to the horizontal as indicated at 81 whereby the shiftable member or yoke 79 may oscillate on the rivet 76 in the manner to be described.

As is clearly shown in Figure 10, an end of the rivet 76 is fixed to one of the side plates or portions of the yoke, here shown as the side portion 78 and it extends through the opposite side portion 77.

The body plate 72 is disposed against the inner face of the yoke portion 78 and between the body plate and the inner face of the opposite yoke portion 77 is disposed the supporting plate 82 for the hereinafter described can rim engaging driving wheel.

Between the rivet 76 and the slot 74, there is formed in the body plate 72, the arcuate cam slot 83. Passing transversely through the can driving wheel supporting plate 82 and the cam slot 83, and having its ends fixed in the opposite sides

77 and 78 of the yoke 79, is a pivot and cam rivet 84.

Passing through and fixed by screw threads or other suitable means, as indicated at 85, in the driving wheel supporting plate 82, is an end of a shaft bearing sleeve 86 which extends through the vertical elliptical slot 74 of the body plate to a substantial distance to the right or outer side of the body plate as shown in Figure 10. The end of this bearing sleeve 86 upon the inner or left side of the supporting plate 82, is enlarged to provide the encircling flange 87.

Extending through the bearing 86 is the can rim engaging driving wheel supporting shaft 88 upon which is secured at the end adjacent to the flange 87, the peripherally toothed can rim engaging driving wheel 89. Upon the opposite end of the shaft 88 is secured an end of the operating handle 90 by means of which rotary motion is given to the driving wheel shaft and wheel and the operation of the wheel supporting plate 82 is effected.

The handle 90 also carries a pivot rivet 91 upon which is mounted, between the body of the handle and the outer or right side of the body plate 72, the cam thrust roller 92.

A spacer sleeve 93 encircles the tubular bearing 86 between the handle and the adjacent face of the body plate to maintain the parts firmly in position.

The side 78 of the yoke which is nearest to the handle 90 has formed along the forward edge thereof the outstanding cam flange 94 which is adapted to be engaged by the roller 92 in the initial clockwise movement of the handle when a can is being secured in the opener.

The opposite side portion 77 of the yoke has formed integral with the top thereof the inwardly extending foot piece 95 which is disposed beneath the can rim engaging driving wheel 89 and functions in the same manner as the foot 47 to maintain the can in the proper position with respect to the adjacent face of the driving wheel.

Rearwardly of the pivot rivet 76, the outer side 78 of the yoke has secured thereto the outstanding pivot stud 96. Upon this stud is pivotally mounted the pawl 97 which has a curved or arcuate rear edge 98 and a straight forward edge 99, the latter edge functioning in the same manner as the edge face 23a of the pawl 23, as a strike face against which the cam roller 92 is adapted to engage.

A spacer sleeve 100 encircles the pivot stud 96 between the pawl 97 and the part 78 and encircling this sleeve is a coil spring 101, one end of which is fixed to the pawl 97 as indicated at 102, while the other end is secured to the outwardly projecting stop lug 103 which is formed integral with the part 78 of the yoke, as shown in Figure 8.

The rear lower part of the pawl 97 has a shoulder portion 104 which engages the stop lug 103 and thus limits the rearward or clockwise turning of the pawl under the action of the spring which is biased to constantly tend to turn the pawl in a clockwise direction.

Figures 8 to 10 of the second embodiment show the parts in the positions which they assume when the can driving wheel is raised to maintain a can in proper position to have the top thereof cut out by the overlying cutter, not shown. To set the parts for the release of the can or to facilitate the insertion of a can, the handle 90 is rotated counterclockwise to bring the roller 92 into engagement with the edge face 99 of the pawl 97 thereby imparting clockwise oscillation or rotation to the yoke 79. When such clockwise rotation has been imparted to the yoke the pivot 84 will be shifted to the lower or rear end of the cam slot 83 and the driving wheel supporting plate 82 will be oscillated to a position where the shaft 88 and bearing sleeve 86 are lowered in the slot 74. The driving wheel 89 will then be at its extreme remote position with respect to the cutter, not shown, and the roller 92 will be between the pawl 97 and the flange 94.

The can is then inserted in the device by holding it in such manner that its upper end is against the cutting edge of the cutter, not shown. The operating handle 90 is then rotated clockwise until the roller 92 contacts the flange 94. This effects the reverse or counterclockwise turning of the yoke thus oscillating and shifting the wheel supporting plate 82 to effect the movement of the can upwardly, through engagement of the toothed edge of the wheel 89 with the flange or rim of the can, until the head of the can is punctured by the cutter. Continued clockwise rotation of the handle 90 then effects the rotation of the wheel 89 and of the can with respect to the cutter, until the can head is cut out. During such clockwise rotation of the handle 90 the roller 92 will intermittently engage the curved edge 98 of the pawl and the pawl will be shifted against the tension of the spring 101 to allow passage of the roller, as will be readily obvious.

Figures 11 to 14 illustrate a modification of the first embodiment of the invention which is illustrated in Figures 1 to 5 inclusive, such modification being directed to the can rest structure and cutter, particularly, with a slight alteration in the thrust mechanism. In this modification the body plate is generally designated 105 and the bottom and forward edges thereof are bordered on the inner or left hand side by the reenforcing flange 106 which also provides a track for a roller corresponding to the roller 34.

Upon the outer or right hand side of this modified structure, the slide plate, handle and cam roller mechanism are the same as shown in Figure 1 and accordingly such structure is not illustrated as the same would be an unnecessary duplication.

The body plate 105 has the upstanding extension 107 upon which is carried the modified can rest and cutter supporting means.

The cutter support comprises a rectangular frame which is generally designated 108 and which comprises the inner side portion 109, the forward and rear ends 110 and the outer terminal portions 111 which are disposed against the inner face of the extension 107 and secured thereto by rivets 112.

Secured to the side 109 of the cutter supporting frame, within the frame, is the fixed depending cutter 113. This is maintained in position by the securing screws 114 as clearly shown in Figures 11 and 12.

The rivets 112 also secure within the frame 108 and against the portions 111, the plate or block 115 which forms a fixed part or spring seat of the yieldable can rest.

The can rest comprises a horizontal plate portion 116 which is disposed beneath the frame 108 and which has at each end the upstanding arm 117, the upper end of the arm being turned inwardly to engage upon the top edge of the plate 115, as indicated at 118. Thus the plate 116 is suspended by the arms from the plate 115 and it is in spaced relation with the bottom edge of the plate 115 so that there may be inserted be-

tween the bottom edge of such plate 115 and the top of the horizontal plate 116, the spring member 119 which yields to permit slight upward or rising movement of the plate 116 in response to pressure applied by the top edge or rim of a can when the latter is having the head cut therefrom by the cutter 113.

This horizontal plate 116 of the can rest has formed integral therewith the spaced inwardly extending feet 120. These feet are disposed upon opposite sides of the fixed cutter 113 and are also engaged upon their under faces by the curved top rim or flange of the can.

The operation of the can thrust mechanism of this modified form of the first embodiment is the same as the first embodiment except that the bottom part of the flange 106 has resting thereon a roller 121 which, together with a smaller roller 122, is mounted upon a pivot stud 123, corresponding to the stud 33 of the first embodiment. This pivot stud 123 is carried upon the slide plate 124 which is mounted upon the right hand side of the body plate 105 for sliding pivotal movement on the pivot rivet 125.

The numeral 126 generally designates the thrust plate which has the rear portion 127 mounted on the rivet 125 and the forward portion 128 which is offset inwardly or to the left as indicated at 129 so as to clear the flange 106 which lies between the forward portion 128 and the body plate 105.

The numeral 130 designates the straight slot in the body plate while the numeral 131 designates the cam slot in the thrust plate 126, in which latter slot the roller 122 engages as illustrated.

The numeral 132 designates the can rim engaging driving wheel and below this is located the rest 133 against which the can bears and by which it is maintained with proper clearance between its side wall and the adjacent face of the driving wheel 132.

In view of the previous description given in connection with the first embodiment, of which the structure shown in Figure 11 is a modification, it is not believed to be necessary to explain in detail the operation of this modification. It will be readily apparent upon reference to Figure 14 particularly that when a can is in position to have the head thereof cut out the top edge of the can rim will bear against the underside of the horizontal plate or floor plate 116 and upward thrust applied to the can will be yieldingly opposed by the spring 119 so that proper traction will be maintained at all times between the toothed periphery of the driving wheel and the underside of the can flange.

Figure 15 illustrates a third embodiment wherein the can rim engaging driving wheel is supported by an oscillatable plate and the plate is oscillated to raise and lower the wheel by a hand lever. In this construction the body plate supporting arm is designated 134 while the body plate proper at the forward end of the arm is designated 135 and the top part of this plate has the vertical extension 136 upon which is supported the can rest structure and cutter of suitable character such, for example, as the one shown in connection with the first embodiment or the one shown in connection with the modification of the first embodiment. Obviously any other type of cutter and rest might be employed if desired.

In the body plate 135 there is formed the vertical elliptical slot 137 through which extends the shaft or arbor 138 which carries at the left hand or inner side of the device, the peripherally toothed can rim engaging driving wheel 139. At the opposite side of the body plate the shaft is connected with suitable crank means to facilitate rotation of the same and the wheel. Since this construction is similar to the previously described constructions it is not believed that an illustration or description of the same is required for a proper understanding of this embodiment.

Below the slot 137 the body plate 135 has formed therein the horizontal slot 140.

The bottom edge of the body plate 135 is bordered by the inwardly directed flange 141 which at its rear end is curved or turned upwardly as indicated at 141*a* to position its end upwardly directed to function as a stop 142.

The numeral 143 generally designates the driving wheel supporting thrust plate which is disposed at the inner or left hand side of the body plate directly over the flange 141. This thrust plate has the rearwardly extending and upwardly directed arm 144 which is rolled at its outer end to provide a bearing sleeve 145 for a pin 146, to the upper end of which is fixed a hand grip or knob 147.

The thrust plate 143 is pressed or otherwise formed to provide the inwardly offset portion 148 which functions as a housing having its open side directed toward the body plate 135.

Extending through the center of the offset portion 148 is a pivot rivet 149 which passes through the body plate aperture 140 as illustrated and carries upon its opposite or outer end the head 150 which positions against the outside of the body plate to maintain the rivet in desired position. This pivot rivet carries a thrust roller 151 which is enclosed within the offset portion 148 and which rests upon the rolls on the top surface of the flange 141.

The rivet 149 is adjacent to the upper edge of the slot 140 but has sufficient clearance from the lower edge of such slot that it will never bear thereon.

As will be readily apparent the shaft or arbor 138 which carries the can rim engaging driving wheel 139, passes through the thrust plate 143 in which it has a bearing so that the wheel 139 is disposed upon the left side of the thrust plate directly above the rivet 149.

As shown the lever 144 of the thrust plate is adapted to engage the stop 142 so that its rearward swinging movement is limited thereby. The forward swinging movement of the lever and oscillation of the plate 143 whereby the driving wheel 139 is lowered, is limited by engagement of the pivot rivet 149 against the rear end of the slot 140. If desired, in lieu of the stop 142, the rearward swinging movement of the thrust plate lever 144 may be controlled by or limited by the engagement of the rivet 149 with the forward end of the slot 140.

It is believed that it will be readily apparent from the foregoing that the vertical movement of the can rim engaging driving wheel 139 by means of which the head of a can is caused to be punctured by the cutter, not shown, is accomplished by oscillating the lever 144 rearwardly and downwardly to bring the parts into the position shown in Figure 15. Reverse movement of the lever will roll the thrust roller rearwardly on the flange 141 thereby rocking the plate 143 and causing the wheel 139 to move downwardly from the cutter.

Figures 16 to 19 inclusive illustrate a fourth

embodiment of the invention wherein a novel slide plate construction is employed for effecting the desired turning or oscillation of the driving wheel supporting plate upon rotation of the operating handle.

In these figures the supporting bracket arm is designated 152 while the body plate at the forward end thereof is designated 153 and the upwardly extending portion of the body plate upon which the cutter and can rest structure may be mounted, is designated 154. This latter structure is not illustrated for obvious reasons hereinbefore stated in connection with the description of the embodiment shown in Figure 15.

The body plate is provided with the vertically disposed elliptical slot 155 and below this it has formed therein the horizontal slot 156.

The bottom edge of the body plate 153 has formed integral therewith the inwardly directed longitudinally extending flange 157 and the bracket arm 152 has a longitudinal slot 158 formed therein for the purpose hereinafter described.

The numeral 159 designates the rocking thrust plate which carries the can rim engaging driving wheel 160. This plate 159 is disposed upon the left side of the body plate directly above the flange 157 and the lower part of the thrust plate 159 has the inwardly offset or inwardly pressed portion, adjacent to its lower edge, designated 161, which portion overlies the horizontal body slot 156 and functions in the same manner as the inwardly pressed portion 148 of the previously described plate 143.

This inwardly pressed portion 161 functions as a can rest also, to hold the can with its side in properly spaced relation with respect to the inner side of the driving wheel 160.

As shown in Figure 18 the upper part of the thrust plate 159 has extended therethrough and secured thereto by the screw threads 162, the relatively long tubular bearing 163 through which extends the shaft or arbor 164, to the inner end of which is secured the driving wheel 160. This tubular bearing 163, like those previously described, has an encircling flange 165 at its inner end which maintains the driving wheel 160 in proper spaced relation with the adjacent thrust plate and brings it into the proper position with respect to the overlying cutter, not shown.

Extending through the slot 156 of the body plate is the relatively long pivot rivet 166, an end of which is secured in the inset portion 161 of the thrust plate, as shown in Figure 18. Rotatably mounted upon this rivet 166 between the wall of the inset portion 161 and the body plate 153, is the roller 167 which rests upon and rolls on the flange 157.

Upon the right hand or outer side of the body plate, there is mounted upon the tubular bearing 163, the eccentric assembly 168. This assembly comprises two spacer disks between which is positioned a journal disk 170.

Secured to the outer end of the shaft 164 is an end of the handle or crank 171 by means of which rotary motion is imparted to the arbor 164. This handle extends across the outer face of the adjacent disk 169 and the three disks of the assembly and the handle are secured together by the rivet 172. It will be seen that while the handle is secured directly to the arbor 164 to impart rotary motion thereto, the eccentric assembly rotates on and freely about the bearing 163.

The numeral 173 generally designates the shiftable member or slide plate. This comprises the inner end portion 174 which is provided with the longitudinal slot 175, and the outer end portion 176 which is in the form of an eccentric collar. This eccentric collar encircles the journal 170 of the eccentric assembly.

As shown in Figure 16, the inner portion 174 and the outer portion 176 of the slide are in parallel offset relation whereby the outer portion is spaced a greater distance from the body plate 153 than the inner portion 174. Between the outer portion of the slide and the eccentric assembly 168 as one part and the body plate 153 as the other part, is positioned a spacer sleeve 177 which encircles the tubular bearing 163 as shown in Figure 18.

Disposed upon the outer side of the body plate 153, between the inner end portion 174 of the shiftable plate 173 and the body plate, is a thrust link 178. It will be noted that the inner end portion 174 of the slide has the right angled downward extension 174a and the slot 175 is in the form of a right angle, the short end portion 175a of which extends downwardly in the portion 174a of the slide member.

The rear end of the link 178 extends across the slot 175 and is apertured to receive the pivot pin 179 which passes through the slot 158 of the bracket arm 152 and through the slot 175.

Within the slot 175 the pivot pin 179 carries the journal 180 and a second journal 181 is mounted on the pin, which fits in the slot 158. The inner and outer ends of the pivot 179 carry the washers 182 and 183 respectively.

The forward end of the link 178 is apertured to receive the pivot rivet 166 as shown in Figures 16 and 18.

For the maintenance of proper engagement between the eccentric collar 176 forming the forward end portion of the slide 173 and the journal 170, a pressure applying means is provided in the form of a spring leaf 184 which is disposed within a recess 184a in the inner periphery of the eccentric collar portion 176, as shown in Figure 16. This spring leaf is initially bowed so that after it is placed in position and it is compressed between the inner wall of the recess 184a and the periphery of the journal 170, it is flattened out as shown in Figure 16.

For convenience in lubricating the relatively moving contacting surfaces at the outer end of the tubular bearing 163, an oil hole 186 is provided in the handle adjacent to the outer end of the tubular bearing 163, as shown in Figures 16 and 18.

In the operation of the fourth embodiment as illustrated in Figures 16 to 19, if the thrust link 178 is not in the extreme rearward position, the operating handle 171 is rotated counterclockwise until the link is in such position. However, when not in use, the thrust link 178 will normally be in its rearwardmost position and the operating handle 171 will be in a rearwardly extending position, which position it assumes upon completion of the operation of opening a can, and which is an out of the way position.

When in such out of the way position, the pivot rivet 166 will be in the rearward end of the slot 156 and the can driving wheel 160 will be in its lowered position. The can is then inserted in the device by holding it in such manner that its upper end is against the cutting edge of the cutter, not shown, which is positioned above the driving wheel and which may be of the disk or the fixed blade type. The operating handle 171 is

then rotated clockwise until the end is cut out of the can.

If the rearward end of the shiftable plate 173 is not in its lowered position as illustrated, it will assume such position upon the initial slight rotation of the operating handle 171. Inasmuch as the journal 180 prevents the slide 173 from rotating further clockwise, further clockwise rotation of the operating handle, through the eccentric journal 170 secured thereto, moves the shiftable plate 173 and the link 178 to the illustrated positions.

As the operating handle is further rotated clockwise to cut the end out of the can, the rearward end of the plate 173 merely reciprocates on the journal 180 in an obvious manner. When the end has been cut out of the can, the operating handle is rotated counterclockwise until the pivot rivet 166 is in the rearward end of the slot 156, thereby releasing the can from the device and preparing it for the reception of the next can.

Although not necessary, it is preferable that the operating handle 171 be in approximately the position illustrated in Figure 16 before commencing the counterclockwise rotation thereof. During the initial counterclockwise rotation of the operating handle from approximately the position shown in Figure 16, the plate 173 rotates therewith until further movement is prevented by the lower end of the shorter portion 175a of the slot 175 engaging the journal 180. Inasmuch as the journal 180 prevents the slide 173 from rotating further counterclockwise, further counterclockwise rotation of the operating handle, through the eccentric journal 170 secured thereto, moves the shiftable plate 173 and the link 178 to positions whereby the rivet 172 will then be in a position approximately 180° from the illustrated position in Figure 16.

The spring 184 maintains sufficient pressure against the eccentric journal 170 at all times to cause the plate 173 to tend to rotate with the said eccentric journal whenever the latter is rotated by the operating handle 171.

Figures 20 and 21 illustrate a fifth embodiment which is essentially the same as the fourth embodiment except for the means employed to effect the reciprocal movement of the pivot rivet corresponding to the rivet 166.

In this embodiment the bracket arm is generally designated 185 and the body plate at the forward end thereof is designated 186 while the upwardly extending portion of the body plate upon which the cutter and can rest, not shown, are mounted is designated 187.

As previously stated this embodiment is essentially the same as that shown in Figure 16 and accordingly it will be understood that all of the mechanism on the left hand side of the body plate is the same as illustrated in Figure 17 and accordingly an illustration and description of this mechanism is believed to be unnecessary.

The body plate has formed therein the vertical elliptical opening 188 and below this opening is the relatively long horizontal opening 189. In the bracket arm rearwardly of the body plate is a relatively long horizontal opening 190. These openings correspond respectively with the openings 155, 156 and 158 of the structure illustrated in Figures 16 to 18.

The supporting shaft for the can rim engaging driving wheel, not shown, is designated 191 and this together with its tubular bearing 192 and corresponding to the tubular bearing 163, passes through the opening 188 for connection with the thrust plate, not shown, and the can rim engaging driving wheel, not shown.

The numeral 193 generally designates the shiftable member or slide plate which comprises the rear portion 194 and the parallel offset forward portion 195. At its forward end the forward portion 195 has cut in the top edge thereof the recess or notch 196 and rearwardly of this notch the top edge of this portion of the slide is cut away to form the relatively long recess 197.

The numeral 198 designates the operating handle which has the angularly extending upper end portion 198a which is secured to the can ring engaging driving wheel supporting shaft 191 whereby to effect the rotation of such shaft and the can rim engaging driving wheel, not shown, attached thereto. As shown in Figure 20 when the slide is rotated in a clockwise direction to the limit of its movement the shaft 191 and bearing 192 will be disposed in the recess 197.

Forwardly of the shaft 191, the portion 198a of the handle has secured thereto the inwardly extending stud 199. This stud, as shown, is adapted to engage in the upwardly opening notch 196 on counterclockwise rotation of the handle.

Extending through the slot 190 in the supporting arm or bracket 185, is the pivot rivet 200 which corresponds to and functions in the same manner as the rivet 179 shown in Figures 16 and 19. On the left hand side of the device this rivet 200 carries the washer 201 and at its opposite end on the right hand side it has mounted thereon the relatively large disk head or washer 202.

Within the opening 190 the rivet 200 is encircled by the journal 203.

The numeral 204 generally designates the thrust link corresponding to the link 178. This link at its rear end has the rivet 200 extended therethrough and rearwardly beyond the pivot rivet 200 the link terminates adjacent its upper edge in the outwardly directed stop lug 205.

The forward end of the thrust link 204 is pivotally joined to the pivot rivet 206 which passes through the body plate opening 189 and which corresponds to the rivet 166. As will be readily understood this rivet 206 serves as the journal for the roller, not shown, corresponding to the roller 167.

The rear end portion of the link 204 lies against the outer side of the body plate supporting arm 185 and disposed against the outer side of this link is the rear end portion 194 of the slide. This rear end portion of the slide also has the pivot 200 extended therethrough and the opening through which the pivot 200 passes is of a size sufficient to receive the journal 207 which encircles the pivot 200 as shown in Figure 21.

Disposed on the rivet 200 between the journal 207 and the washer 202, is a spacer 208. Encircling this spacer is a coil spring 209, one end of which is secured to the rear end portion 194 of the shiftable plate 193, as indicated at 210 in Figure 20, while the other end of the spring is secured to the washer 202 as indicated at 211. The bias of this spring is such as to constantly urge clockwise rotation of the plate 193 whereby to normally maintain connection between the forward end of the slide and the stud 199 of the handle.

The rear end portion of the plate 193 is extended to form the movement limiting finger 194a. This finger and the stop 205 move rela-

tively in a common circular path and accordingly it will be seen that downward or counterclockwise swinging movement of the slide will be limited by engagement of the finger 194a with the underside of the stop 205.

It is believed that it will be readily apparent from the foregoing that in the use of the embodiment shown in Figure 20, when counterclockwise rotation is imparted to the handle 198 the plate 193 will be oscillated counterclockwise by the stud 199 engaged in notch 196, against the tension of the spring 209 and rearward thrust will also be applied to the slide causing it to move backwards or rearwardly. This will impart a rearward movement to the thrust link 204 and will oscillate the thrust plate, not shown, on the left hand side of the device so as to effect the lowering of the can rim engaging driving wheel, not shown. After the can has been placed in position, clockwise rotation given to the handle 198 will then pull the slide forwardly together with the thrust link 204 and the rivet 206 to shift the can rim engaging driving wheel, not shown, back to raised position. When the wheel has reached this latter position the parts will be in the position shown in Figure 5 and continued rotation of the handle will cause the stud 199 to escape from the notch 196. The handle may then be continually rotated until the can head is cut out. During such continuous rotation the stud 199 will engage in the recess 197 and depress the slide in passing beneath the shaft 191. The spring 209 will keep the slide continually raised at all other times so that when the completion of the cutting operation is had, reverse or counterclockwise rotation of the handle will bring the stud 199 back into the notch 196 as previously described.

Figures 22, 23 and 24 illustrate a modification of the fourth embodiment. Such modification is directed particularly to the thrust plate actuating means and to the can rest and cutter head structure. Accordingly it will be understood that since the parts on the outer or right hand side of this modified structure are the same as shown in Figure 16, a detail illustration and description of the same are not believed necessary and are not given.

In this modification of the fourth embodiment, the body plate is generally designated 212 and the extended upper end portion is designated 213 and is inclined slightly toward the left hand side of the device, as shown in Figure 23.

The body plate is provided with the usual vertically disposed elliptical slot 214 and directly below this slot, is fixed the pivot rivet 215 on which is pivotally mounted, on the inner or left hand side of the body plate, an end of a short thrust link 216.

The numeral 217 designates the thrust plate, the lower part of which is pressed or formed to provide the inwardly extending or projecting offset housing 215', the open side of which is directed toward the left hand side of the body plate 212.

The body plate 212 is provided, between the rivet 215 and the opening 214, with the arcuate opening 217', the radius of which is struck from the center of the rivet 215, as shown in Figure 22. At the outer or right hand side of the body plate is the thrust link 218, corresponding to the link 178 while on the inner side the short thrust link 216 extends across this slot 217' and has an opening to receive the large diameter part 219 of a pivot rivet 220 which has the smaller end thereof fixed in the wall of the inpressed portion 215' of the thrust plate 217. The portion 219 of the pivot rivet 220 also extends through the arcuate slot 217' and is secured to the link 218. It will be readily seen that this rivet corresponds to the rivet 166 previously described.

Extending through the upper part of the thrust plate 217 and secured thereto in the same manner as shown and described in connection with the structure of Figure 18, is the tubular or sleeve bearing 221 through which extends the shaft 222, upon the inner end of which is fixed the peripherally toothed can rim engaging driving wheel 223.

Secured to the shaft 222 is the crank 224 and secured to the crank and encircling the shaft and bearing as shown, is the eccentric assembly 168a which is of exactly the same construction as the assembly 168 as shown in Figures 16 and 18 and accordingly a more detailed description of this assembly is believed to be unnecessary. This eccentric assembly, corresponding to the assembly 168, is of somewhat smaller size than the assembly 168 inasmuch as the pivot rivet 220, corresponding to the rivet 166, moves a lesser distance horizontally than the pivot rivet 166 if the flange upon which the roller 167 rolls is not cammed from the horizontal plane.

The numeral 224a designates the disk cutter which is integral with the shaft 225 and the inwardly extending portion 226.

The numeral 227 designates the tubular bearing for the shaft 225 and the inner end of this tubular bearing is of elliptical form to provide the clearance 228 above the shaft which permits the extended portion 226 of the shaft 225 to always seat against the radial surface of the hereinafter described thrust wheel. The tubular bearing 227 is extended through a suitable opening in the inclined portion 213 of the body plate and is secured by the nut 229.

Positioned above and parallel with the shaft 225 is a thrust wheel supporting shaft 230 having the threaded end 231 which extends through a suitable opening in the body plate portion 213 and receives at the outer side of the body plate the securing nut 232.

The shaft or journal 230, which is in the form of a bolt, has rotatably mounted thereon the thrust wheel hub 233, the inner end of which is integral with the disk 234 which forms a part of the wheel. Corresponding with this disk 234 as a part of the wheel is a disk 235. Encircling and shrunk on the hub 233 is a sleeve 236 which limits the outward movement of the thrust wheel 235 on the hub portion of the wheel 234. The fixing of this sleeve 236 on the hub portion of the wheel 234, also maintains the centering guide 237 and the thrust spring 238 in place, as well as maintaining the thrust spring 238 under any predetermined amount of compression.

The longitudinal postion of the journal support bolt 230 in the oblique or angled portion 213 of the body plate is adjustable by screwing the bolt inwardly or outwardly as desired to effect the positioning of the flange or periphery of the thrust wheel 234 in relation to the lower portion of the thrust wheel 235, thereby to further compress the spring 238 between the lower portion of the flange of the thrust wheel 234 and the lower portion of the thrust wheel 235. As shown the outer side of the thrust wheel 235 engages the inner side of the disk cutter 224a and the periphery of the wheel 235 engages the portion 226 of the cutter. By making the longitudinal ad-

justment of the journal support bolt 230 as described it will be seen that a greater inward thrust against the disk cutter 224a will be required to move the said cutter inwardly.

Rearwardly of the thrust wheels, the inner side of the inclined or oblique portion 213 of the body plate has secured thereto by the rivets 239, the foot plate 240, a portion of which is angled to extend inwardly in a plane perpendicular to the adjacent side of the body plate, forming the foot or can rim rest 241.

Cooperating with the rest 241 and at the forward side of the portion 213 is a vertically yieldable rest 242. This rest is also perpendicular to the body plate 212 as shown in Figure 24 and has at its side edges the laterally extending ears 243 which engage the face of the body plate as shown in Figure 22.

The body plate is provided with the slot 244 through which extends the arm 245 which is integral with the rest 242 and this arm extends upwardly upon the outer side of the inclined portion 213 of the body plate and has its upper end disposed across the elliptical slot or opening 246 which is formed in the portion 213 of the body plate.

Secured to the upper end of the arm 245 and extending inwardly through the opening 246, is a pin 247 which is encircled by the helical spring 248, one end of which bears against the inner side of the body plate portion 213 while the other end bears against the head 247a of the pin.

When a can is in the device and the can driving wheel is in the upper or operating position, the resilient can rest 242 will be oscillated slightly upwardly against the tension of the spring 248. This resilient can rest 242 exerts a slight downward pressure against the rim of the can, which improves the traction of the can driving wheel with the under edge of the rim or flange of the can. Also, the can rest 242 is preferably formed in such manner that it will bear at a predetermined angle across the rim of the can, thereby guiding the can in relation to the disk cutter to assure that the disk cutter cuts the end of the can out at the desired point in relation to the rim of the can for easiest operation.

Figures 25 and 26 illustrate the sixth embodiment wherein the supporting or bracket arm is designated 249 and the body plate at the forward end of the arm is designated 250. Provision is made at the upper part of the body plate 250 for securing thereto any desired form of rest and cutter head structure, by providing the vertical extension 251.

The lower part of the body plate 250 has formed upon the inner or left hand side thereof the peripheral flange 252 which has a vertical portion 252a at the forward edge of the body plate, and an upwardly and rearwardly curving portion 252b at the rear portion of the under or bottom edge.

At the lower part of the body plate forwardly of the rearwardly curving flange portion 252b and at an elevation below the straight forward portion 252a of the flange, is secured the pivot rivet 253 upon which is mounted for rocking movement, upon the inner or left hand side of the body plate, the driving wheel supporting link 254. As shown the rivet 253 passes through the link adjacent to the lower end thereof and said lower end of the link is provided with the inwardly directed foot 255 which provides a can rest for engagement against the side wall of the can when the latter is applied to the device.

Above the rivet 253, the body plate 250 has formed therein the relatively large arcuate slot 256 the radius of which is struck from the center of the rivet 253.

The link 254 has a bearing opening 258 therein, in which is positioned a journal 259. Passing through the journal 259 is a relatively long rivet pin 260 upon the inner end of which is secured the can rim engaging driving wheel 261. Upon the opposite side of the journal 259 the rivet pin 260 carries the circular spacer 262. This disk spacer 262 lies within the arcuate slot 256 and is maintained against the outer side of the link 254 as shown in Figure 26.

The rivet pin 260 upon the right hand or outer side of the opener device carries the eccentric assembly which is generally designated 263. This assembly comprises the inner and outer disks 264 and the intermediate journal disk 265 which, as shown, is of smaller diameter than the disks 264. Upon the outer side of the outer one of the disks 264 is positioned the end of the handle 266. The rivet pin 260 passes eccentrically through the disks 264 and 265 and also passes through the adjacent end of the handle 266 and it has its two ends swaged so as to firmly secured together in side by side relation all of the elements through which it passes. Due to the fact that the pin 260 is of polygonal cross sectional design it will be seen that all of these elements are maintained securely against turning or rotation on the disk. Accordingly when the handle 266 is rotated the eccentric assembly, the spacer disk 262, the journal 259 and the can rim engaging wheel 261 will be rotated as a unit.

The numeral 267 generally designates the shiftable or slide plate which is formed to provide the rear portion 268 and the outwardly offset forward portion 269. The portion 268 lies against the adjacent side of the arm 249 and has formed therein the angled slot 270, the major portion of which is extended longitudinally of the slide while the minor angularly directed portion which is designated 270a is directed downwardly.

The forward end portion 269 of the slide is formed to provide the eccentric strap or band 271 which encircles the eccentric journal 265 and is maintained in position thereon between the plates or disks 264.

While the same is not shown it is contemplated to employ between the inner periphery of the eccentric strap and the periphery of the eccentric journal 265, a spring element corresponding to the spring 184 shown in Figure 16.

Secured to the arm portion 249 is a rivet pin 272 which carries a head 273. Encircling this rivet pin is the journal 274 which lies in the slot 270 of the slide member as shown in Figure 25.

In the operation of this sixth embodiment if the operating handle 266 is not in its rearward position, in which position it will normally be upon completion of the operation of opening a can, as in previous embodiments, it is rotated counterclockwise until in such position. The can driving wheel 261 will then be in its lower position so that the can can be inserted for the engagement of the underside of the rim thereof with the top of the periphery of the driving wheel. The operating handle is then rotated clockwise until the head of the can is cut out. During the first half turn of the operating handle, the can driving wheel 261 will be moved forwardly and upwardly to approximately the position illustrated in Figure 25, by the action of the eccentric journal 265 in its bearing in the forward end of the shiftable

plate 267, inasmuch as the plate 267 cannot move further rearwardly by reason of the journal 274 which is anchored to the body plate or arm 249. Further clockwise rotation of the operating handle automatically causes the can driving wheel and the upper end of the supporting link 254 to move slightly forwardly, due to the engagement of the teeth of the can driving wheel with the can flange, until further forward movement is prevented by engagement of the upper end of the supporting link 254 with the adjacent vertical portion 252a of the flange 252. As the operating handle is rotated further clockwise to effect the cutting out of the end of the can the eccentric journal 265 reciprocates the rearward end of the plate 267 on the journal 274. Although not necessary, the counterclockwise rotation of the operating handle is preferably commenced when the handle is in approximately the forward position. As the operating handle is rotated counterclockwise from the forward position, the rearward end of the plate 267 moves upwardly until further movement is prevented by the lower end of the shorter portion of the slot 270a engaging the journal 274. As the handle 226 is further rotated counterclockwise until in approximately a rearward position, the supporting link 254 will be oscillated clockwise to its extreme position and the can driving wheel 261 borne thereby will be in its lower position thereby releasing the can from the device.

Figures 27 and 28 illustrate a seventh embodiment of the invention wherein the numeral 275 designates the supporting arm for the body plate 275a which is at the forward end thereof. The inner of left hand side only of this structure is shown since the parts at the opposite side are the same as that shown in Figure 16 in connection with the fourth embodiment. Since it is believed that an understanding of the arrangement and operation of the structure can be readily had without illustrating the right hand side but simply by referring to the structure shown in Figure 16, an illustration of the right hand side of the present embodiment is not required or a description thereof.

In this embodiment the body plate has secured to the inner side the pivot rivet 276. Upon this rivet is mounted for rocking movement, the thrust plate 277, the forward end of which extends across the arcuate slot 278 which is struck from the center of the rivet 276.

The plate 277 carries the journal and shaft 279 for the can rim engaging driving wheel 280. The said journal and shaft extend through the slot 278 and are connected to the operating handle and other parts upon the right hand side of the body plate, such parts corresponding, as previously stated, to the parts shown in Figure 16.

Below the driving wheel 280 which, as shown, is positioned on the inner side of the thrust plate 277, is fixed the can rest or foot 281 which, as shown, may comprise a portion of the plate 277 cut therefrom and turned outwardly in an obvious manner.

Rearwardly from the rivet 276, there is fixed to the arm 275, the pivot rivet 282 and in advance of this rivet 282 and at an elevation below the same is an arcuate slot 283 which is struck from the center of the rivet 282.

The rivet 282 has pivotally mounted thereon one link 284 of a toggle unit which is generally designated 285. The lower end portion of this link 284 is offset from the body plate and has secured therein one end of a pivot pin 286, which pin extends through the slot 283 and carries upon its opposite end the washer 287 which is in spaced relation with the outer or right hand side of the body plate as shown in Figure 28.

Pivotally mounted on the pivot pin 286 between the offset portion of the link 284 and the body plate 275, is an end of the other one of the two links making up the toggle, which other link is designated 288.

The rear lower part of the thrust plate 277 is inwardly offset as indicated at 289 to provide a space between the rear end of the thrust plate and the body plate, in which is received the lower end of the link 288. This lower end of the link 288 is pivotally secured to the offset portion 289 of the thrust plate, by the pivot rivet 290.

The inner end of the rivet 282 has the large head 282a and between this head and the upper end of the link 284 is retained the spring member 291 which, as shown, is in the form of two spaced flat elements which are joined at one end and are held pressed together under tension between the head of the rivet 282 and the adjacent end of the link 284. This spring functions to apply a predetermined amount of pressure against the link 284 to maintain it against accidental oscillation when in any operating position.

In Figure 28 the numeral 292 designates the rearward portion of a slide corresponding to the rearward portion of the shiftable plate 173 shown in Figure 16 while the numeral 292a designates a slot in this slide which corresponds to the slot 175 in the plate 173. In this embodiment the washer 287 retains the rear end of the slide 292 in position upon the pivot pin 286.

In the operation of this embodiment if the journal rivet or pivot pin 286 is not in the extreme rearward and downward position, in the arcuate slot 283, the operating handle, not shown, is rotated counterclockwise until the pin is in such position. However, when not in use, the journal rivet or pivot pin 286 will normally be in such position and the operating handle, not shown, will be in the rearwardly extending position, which position it assumes upon completion of the operation of opening a can and which is an out of the way position. When the handle is in such out of the way position the plate 277 will be rocked on the pivot 276 and the wheel 280 will be lowered. The can is then inserted in the device and the operating handle is then rotated clockwise until the end is cut out of the can. During approximately the first half turn clockwise of the operating handle, the slide corresponding to the plate 173 of the fourth embodiment, moves the pivot pin or journal rivet 286 to the illustrated position thus straightening out the toggle 285 and elevating the can driving wheel 280 to the upper or operating position. Continued clockwise rotation of the operating handle, not shown, will then cut the head from the can and reverse or counterclockwise rotation thereof will effect the swinging downwardly and rearwardly of the pivot pin 286 in the slot 283 to lower the driving wheel 280.

Figures 29 to 32 illustrate the eighth embodiment of the invention wherein the supporting arm is designated 295 which carries the relatively long body plate 296 at its forward end. In the forward end of the body plate is the vertically disposed slightly arcuate elliptical slot 297 which has its radius struck from the center of the pivot rivet 298 which is secured to the body plate 296 directly rearwardly of the slot 297. This rivet

298 carries the relatively long thrust plate which is generally designated 299.

The pivoted thrust plate 299 has formed around substantially the entire perimeter thereof the inwardly directed flange 300 and a portion of this flange at the forward end of the plate 299 is extended inwardly to form the can rest 301 which maintains the can in spaced relation with respect to the adjacent face of the peripherally toothed driving wheel 302 which is carried by the plate 299 as illustrated in Figure 30. This driving wheel is supported upon the usual shaft 303 which passes through the tubular bearing 304 which is secured to the plate 299 in the same manner as the hereinbefore described bearings.

Rearwardly of the rivet 298 there is formed in the body plate 296, the arcuate slot 305 the radius of which is struck from the center of the rivet 306 which is secured to the body plate as shown. The arcuate slot 305 opens inwardly through the larger arcuate slot 307 which is formed in the plate 299 and which has the lower or convex edge broken to form the two curved seats 308.

Upon the outer or right hand side of the body plate 296 there is pivotally mounted upon the rivet 306 the hanging link 308 which extends downwardly across the slot 305 in the body plate 296. This hanging link 308 carries the pivot pin 309 which has an enlarged inner end portion 309*a* which extends into and through the arcuate slot 305 and also through the slot 307 where it carries the roller 310 which fits snugly within the slot 307 as shown in Figure 30.

Upon the right hand side of the body plate 296 is the slide link or shiftable plate 311 which comprises the rear portion 312 in which is formed the elongated slot 313 having at its rear end the angular extension 313*a*. The link or plate 311 also comprises a forward portion 314, the forward end of which is of circular form as shown in Figure 29 or in the form of an eccentric strap similar to that in the fourth embodiment shown in Figure 16. In this connection it is to be explained that the plate 311 and the forward end portion thereof which comprises an eccentric assembly which is here generally designated 315, is of the same design and construction as that shown in Figure 16 and accordingly no further detailed illustration and description of this assembly and slide are considered necessary to a proper understanding of the operation of the embodiment presently being described.

Encircling the pivot pin 309 between the link 308 and the adjacent end 312 of the plate 311 is a retaining washer 316 and upon the outer end of this pin 309 is a corresponding washer 317. Between the washers 316 and 317 is a journal 318 which encircles the pin 309 and slidably engages in the slot 313.

Upon the outer or right hand side of the body plate above the shaft 303 upon which the handle 319 is secured, is disposed the relatively long bow spring 320 the center of which is apertured to receive the cutter wheel carrying shaft 321 which passes through the body plate and carries upon the opposite or inner side the cutter wheel 322. This spring 321 has the laterally turned end portions 323 and 324, the latter portion being of reduced width and extending into an opening 325 formed in the body plate whereby turning movement of the spring on the shaft 321 is prevented.

At the rearward side of the cutter wheel 322, there is secured to the inner side of the body plate by means of the rivets 326, the plate 327, the lower end of which is turned to extend inwardly to provide the can rest 328. On the opposite or forward side of the cutter wheel from the fixed rest 328 is a yieldable or resiliently mounted rest 329 which has at its edge adjacent to the body plate, the tongue 330 which extends through the body plate opening 331 as shown in Figure 32. This tongue is turned upwardly as indicated at 330*a* to maintain the plate in position and at the inner side of the body plate the rest is provided at opposite sides with the ears 332 which bear against the adjacent face of the body plate.

Upon the inner side of the body plate the rest 329 has the upwardly extending portion 333 to which is secured the pin 334 which extends outwardly through the elliptical opening 335 in the adjacent portion of the body plate. This pin 334 is encircled by a spring 336 which is under compression between the adjacent upstanding part 333 of the rest and the body plate. As shown in this view and in Figure 30 the upper part of the body plate adjacent to the cutter and the rests 328 and 329 is inclined slightly inwardly or to the left whereby the edge of the cutter wheel is disposed at the proper angle with respect to the inner side face of the can rim engaging driving wheel 302 for the most efficient operation of the cutter.

The operation of all of the parts to the right of the body plate 296 is the same as that of the fourth embodiment.

If the journal rivet 309 is not in the extreme rearward and upward position in the arcuate slot 305, the operating handle is rotated counterclockwise until it is in such position. However, when not in use, the journal rivet 309 will normally be in such position and the operating handle will be in a rearwardly extending position, which position it assumes upon completion of the operation of opening a can and which is an out of the way position.

When in such position, the roller 310 will be in the rearward end of the slot 307 and the can driving wheel 302 will be in the lowered position. The can is then inserted in the device by holding it in such a manner that its upper end is against the cutting edge of the cutter. The operating handle is then rotated clockwise until the end is cut out of the can.

During approximately the first one-half turn clockwise of the operating handle, the link corresponding to link 174 of the fourth embodiment, moves the journal rivet 309 and the roller 310, supported for rotation thereon, to the forward or illustrated position, Figures 29 and 30, thus elevating the can driving wheel to the upper or operating position as shown in these figures.

When the end has been cut out of the can, the operating handle is rotated counterclockwise until the roller 310 is in the rearward end of the slot 307, thereby lowering the can driving wheel 302 and releasing the can from the device.

When a can is in the device and the can driving wheel is in the upper or operating position, the resilient can rest 333 will be oscillated slightly upwardly against the tension of the spring 336 This resilient can rest 333 exerts a slight downward pressure against the rim of the can, which improves the traction of the can driving wheel 302 with the under edge of the rim or flange of the can. Also, the floor portion 329 of this resilient can rest is preferably formed in such a manner that it will bear at a predetermined angle

across the rim of the can, thereby guiding the can in relation to the disk cutter to assure that the disk cutter cuts the end of the can out at the desired point in relation to the rim of the can for easiest operation.

The bow spring 320 functions in the same manner and for the same purpose as the bow spring 69 of the first embodiment. If desired, the length of the slot 307 may be increased by increasing the diameter of the eccentric journal which is similar to the eccentric journal 170 of the fourth embodiment.

Figures 33, 34 and 35 illustrate another form of resilient can rest which might be used in association with any of the various embodiments of the present can opener structure in place of the rests shown in association therewith. This modified can rest structure comprises the resilient rest portion generally designated 337 and the fixed upper portion which is generally designated 338. The yieldable or resilient portion 337 comprises a floor plate 339 which has one edge disposed against the left hand or inner side of the body plate which is here designated 340. This body plate engaging edge of the floor plate also carries the two outwardly directed ears 341 which engage in correspondingly formed openings 342 in the body plate and at the center of the body plate engaging edge, the floor plate 339 carries the downturned tongue 343 which bears against the adjacent face of the body plate as shown in Figure 34.

At its front and rear edges the floor plate 339 has formed therein the notches 344 and at its inner edge the floor plate has formed integral therewith the upstanding pin 345.

The upper or fixed part of the can rest shown in Figures 33 to 35 comprises the fixed wall plate portion 346 which is riveted to the body plate 340 as indicated at 347 and the lower edge of this plate 346 has the downwardly extending ears 348 which engage in the notches 344 of the movable floor plate while the upper part of the plate 346 has the inwardly directed portion 349 which carries the inner edge downwardly directed pin 350 which is in spaced opposed relation with the upwardly directed pin 345 of the movable floor plate. Between the floor plate 339 and the inwardly extending portion 349 is interposed a coil spring 351 which has the pins 345 and 350 extended into its ends.

In operation when a can is placed in the opener device and the can driving wheel is in the upper or operating position, the resilient can rest 337 will be oscillated slightly upwardly against the tension of the spring 351. This resilient can rest 337 exerts a slight downward pressure against the rim of the can, which improves the traction of the can driving wheel with the under edge of the rim or flange of the can. Also, the floor portion 339 of this resilient rest is preferably formed in such manner that it will bear at a predetermined angle across the rim of the can, thereby guiding the can in relation to the disk cutter to assure that the disk cutter cuts the end of the can out at the desired point in relation to the rim of the can for easiest operation.

Figures 36 to 38 illustrate a ninth embodiment of the invention wherein a part of the operating mechanism is enclosed in a cover or housing which is located upon the outer or right hand side of the device.

In this embodiment the numeral 415 generally designates the body or mounting plate which, as in the preceding embodiments is designed to be secured in a suitable manner to extend forwardly from a supporting structure. Formed in the body plate is the short arcuate slot 416, the concave side of which is directed downwardly and rearwardly slightly as shown. Below this slot there is secured in the plate 415 the pivot rivet 417 from the center of which the arc for the slot 416 is struck and this rivet 417 has connected therewith one end of a toggle unit which is generally designated 418 and which is essentially of the same construction as the toggle unit shown in Figures 27 and 28 in that it comprises the two link members 419 and 420 which are pivotally coupled together by the pin 421, one end of which pin extends through the slot 416 and moves, in the operation of breaking the toggle unit or straightening it out, in the slot 416 on the pivotal center of the pivot 417. This toggle unit is in substantially inverted position from the position in which it is shown in Figure 27 but, as stated, its construction and operation is the same and accordingly it is believed that a more detailed illustration and description of the unit is unnecessary to a proper understanding of the operation of this embodiment of the opener.

While the pivot pin 421 extends at its inner or left hand end only into the slot 416 the outer or right hand end extends a substantial distance to the right beyond the toggle unit 418 for connection with an eccentric operated slide such as that shown in Figure 16 and generally designated by the numeral 173. Such eccentric operated slide is not illustrated in association with the ninth embodiment as it is believed that the manner of its operation will be readily apparent.

The numeral 422 generally designates the oscillatable support plate for the disk cutter, hereinafter described. This plate which comprises the integral forward and rear portions 423 and 424 respectively, is mounted substantially midway of its ends for rocking movement upon a pivot pin 425 which passes through and is supported by the body plate 415. The rear end of the portion 424 of the oscillatable support plate is connected, by the pivot rivet 426 with the other or upper end of the toggle unit link 420. Thus it will be seen that when the toggle unit is broken by movement of the pin 421 rearwardly and downwardly in the slot 416, the rear end of the cutter supporting plate 422 will be pulled downwardly.

Forwardly of the pivot 425, the body plate 415 has formed therein the short vertical arcuate slot 427 the arc of which is struck from the center of the pivot 425. Directly below this slot 427 the body plate has fixed therein one end of the tubular bearing 428, the inner or left hand end of which has an integral collar 429 which bears against the inner side of the body plate while the major portion of the bearing extends to the right or outer side of the body plate as shown in Figure 37.

Mounted within the bearing 428 is the shaft 430 for the can rim engaging driving wheel 431 which is mounted upon the inner or left hand end of the shaft as shown in Figure 37. The opposite or outer end of the shaft terminates in the reduced portion 430a which is of square or polygonal cross section and this in turn terminates in the reduced threaded end 430b which is adapted to receive the holding or securing nut 432 for maintaining in position the hereinafter described parts.

The tubular bearing 428 is maintained in proper position by the nut 433 which is threaded there-

on and engages the right hand side of the body plate and draws the collar **429** tightly against the left hand side as shown in Figure 37.

The bearing **428** and the shaft **430** extend outwardly through a short arcuate slot **434** which is formed in the cutter supporting plate, in the forward portion **423** thereof as shown in Figure 36. Thus this bar is permitted limited oscillation on the pivot **425** with respect to the shaft and bearing. The lower part of the portion **423** of the support bar is offset outwardly from the body plate **415** as shown in Figure 37 thereby forming the inclined portion **423***a* which overlies or is positioned to cover the outer side of the arcuate slot **427**. This inclined portion **423***a* of the supporting bar has secured therein one end of a journal bolt **435** upon which is rotatably mounted the rotary disk cutter **436**. It will thus be seen that the journal bolt **435** is disposed at an angle with respect to the body plate **415** to position the cutting edge of the disk cutter in proper working relation with the can rim engaging driving wheel **431**. By the provision of the slot **427** the disk cutter is moved relative to the wheel **431** when the supporting plate **422** is oscillated.

The forward end of the supporting plate has the narrow portion **423***b* which lies against and parallel to the outer side of the body plate and the lower end of this part carries a pin **437**. At the upper end or top of the part **423***b* the supporting plate has formed therein the elliptical slot **438** and paralleling this slot **438** is a longer slot **439** which is formed in the body plate and which is struck from the center of the pivot **425**.

Upon the left hand or inner side of the body plate, adjacent to the top thereof, is positioned the relatively long oscillatable can rest which is generally designated **440**. This can rest at one end is mounted upon the pivot pin **425** for vertical oscillation independently of the supporting plate **422**. The can rest extends forwardly and overlies the slot **439**. This forward end of the can rest bar carries a pin **441** which extends to the right through the two slots **439** and **438** and upon the outer or right hand side of the supporting bar the pin **441** has attached thereto an end of a contracting or pull spring **442**, the other end of which spring is attached to the pin **437**.

The lower edge of the oscillatable can rest bar has the recess **440***a* formed therein through which the journal bolt and a portion of the cutter disk extend and at opposite sides of this recess **440***a* there are formed the horizontal inwardly extending can rim engaging feet **443**.

Below the can rim engaging driving wheel **431** there is secured to the body plate, upon the inner or left hand side, the can guard **444** against which the side of a can positions when it is mounted upon the opener to have the head thereof cut out.

Operation of the present embodiment of the can opener is accomplished through the medium of a crank handle **445** one end of which is mounted upon the square portion **430***a* of the shaft **430**, together with other parts about to be described. It will be understood that the outer end of the crank **445** is provided with a suitable handle or knob, not shown, by which the crank can be grasped to effect rotation of the shaft **430**.

In association with the crank there is employed an eccentric thrust link, not shown, but which is of the same design or construction as the shiftable plate or link **173**, for example, shown in Figure 16. The rear end of such link receives in the slot thereof the pin **421**, as, for example, the pin **179** is received in the slot **175** of the structure shown in Figures 16 and 19, while the forward end of the link is in the form of an annular strap **446** which encircles an eccentric journal **447** mounted eccentrically, as shown in Figure 37, upon the outer end of the bearing **428**. This journal **447** is positioned between two spacer disks **448** and **449** and the three parts are held together by a rivet **450**. The spacer disk **448** is eccentrically mounted on the bearing **428** to turn therearound with the journal **447** and between this disk **448** and the cutter supporting bar is a spacer washer **451**.

The outer disk **449** of the eccentric assembly is eccentrically mounted upon the squared portion **430***a* of the shaft **430** so that it does not have turning movement independently of the shaft but is compelled to turn with the shaft. Between this outer disk **449** and the crank **445** is a spacer washer **452** which is fixed upon the squared portion **430***a* of the shaft.

Formed through the spacer disk **449**, the washer **452** and the handle or crank **445** is an oil hole or passage **453**.

The mechanism on the right or outer side of the body plate, with the exception of the operating crank **445**, is enclosed within a casing or housing **454** which is secured to the body plate **415** in any suitable manner as, for example, the top and bottom edges and the forward edge of the body plate may be received within the side walls of the casing as shown in Figure 37.

The right or outer side of the casing **454** is provided with an opening **455** in which the spacer washer **452** is positioned.

In the operation of this embodiment of the can opener, if the journal rivet **421** is not in the extreme rearward and downward position in the arcuate slot **416**, the operating handle **445** is rotated counterclockwise until it is in such position. However, when not in use, the journal rivet **421** will normally be in such position and the operating handle will be in a rearwardly extending position, which position it assumes upon completion of the operation of opening a can and which is an out of the way position.

When the operating handle or crank **445** is in the out of the way position the disk cutter **436** and the forward end of the can rest **440** will be in their raised positions. When a can is not in the device, the spring **442** maintains the rivet pin **441** in a seated position in the lower end of the slot **438** so that the can rest **440** oscillates with the oscillatable support plate **422**, inasmuch as both of these parts are pivoted for oscillation on the same axis. It will be understood that while the cutter supporting plate **422** and the oscillatable can rest **440** are mounted upon the same pivot **425** they are not secured to the pivot in such manner that one cannot oscillate independently of the other.

With the parts in the position stated the can is then inserted in the device by holding it in such a manner that its upper end is against the cutting edge of the disk cutter **436**. The operating handle or crank **445** is then rotated clockwise until the end is cut out of the can. During approximately the first half turn clockwise of the operating handle or crank the link, not shown, corresponding, for example, to the link **173** and of which the eccentric strap **446** forms a part, moves the journal rivet **421** to the position illustrated in Figure 36, thus straightening out the toggle unit **418** and lowering the disk

cutter 436 to the position shown in Figures 37 and 38, that is, to the operating position. Since the axis of the can driving wheel is fixed it will be apparent that the disk cutter will puncture the end of the can as it is moved to this position.

As the forward end of the oscillatable support bar for the disk cutter is lowered, the forward end of the can rest 440, through the predetermined tension of the spring 442, follows until the feet 443 of the can rest seat firmly on the top of the rim or flange of the can. When the can rest has arrived in such position the forward end of the oscillatable support bar for the disk cutter moves slightly further downwardly, thereby unseating the rivet pin 441 from its seat in the lower end of the slot 433 in such a manner that the feet 443 bear upon the top of the rim or flange of the can under the tension of the spring 442.

The offsetting of the portion 423 of the oscillatable support plate permits the portion of the body plate adjacent thereto, which would probably have sufficient resiliency for the purpose, to be forced outwardly a predetermined amount when necessary, such as when the seam of a can comes between the disk cutter and the can driving wheel. The resilient can rest 440 maintains the can in alignment in the device and also exerts a predetermined downward pressure on the top of the rim or flange of the can to provide adequate traction of the can driving wheel 431 with the under edge of the flange of the can. When the end has been cut out of the can, the operating handle or crank 445 is rotated counterclockwise until the journal rivet 421 is in its extreme rearward and downward position in the arcuate slot 416, thereby raising or elevating the disk cutter 436 and the forward end of the oscillatable can rest 440 to their uppermost positions, releasing the can from the device and preparing the device for the reception of the next can.

The bearing of the disk cutter, the bearing for the can driving wheel, and the bearing for the eccentric journal can be lubricated without removal of the cover or housing 454.

Figure 39 shows a slight modification of the eccentric journal mounting and associated parts. In this figure a portion of the cover casing only is shown and is generally designated 454a. In this modification the shaft for the can rim engaging driving wheel is designated 430' and as shown the outer or right hand end is provided with a short terminal portion 430'' of square or polygonal cross section. The numeral 428a designates the outer end of the tubular bearing for the shaft and upon this bearing are mounted all of the elements of the operating eccentric. These elements comprise the eccentric journal 447a, the spaced spacer disks 448a and 449a and the washer 452a which corresponds to the spacer washer 452 but which is of materially greater diameter than the washer 452. The numeral 446a designates the eccentric strap or ring which forms a part of the eccentric thrust link, not shown, previously described. In this modified arrangement the crank or handle which is designated 445a is mounted upon the squared portion 430'' of the shaft and is held in place by the nut 432a. The elements 447a, 448a, 449a and 452a are coupled together to turn as a unit, by the rivet 450a and this rivet has an enlarged head 450b at its outer end which engages in an aperture in the crank 445a. By this means rotary motion is imparted to the eccentric unit.

Provision is made for lubricating the parts by means of an oil hole 453a which is formed through the handle adjacent to the end of the bearing 428a as shown.

Figures 40 and 41 illustrate a tenth embodiment as viewed from the inner or left hand side of the device. No showing is made of the cutter mounting since it will be readily apparent that any suitable cutter may be supported in proper position above and adjacent to the can rim engaging driving wheel for cooperation therewith. Also in this embodiment no detailed illustration has been made of the eccentric thrust link it being understood that such thrust link will be of the same general form and mounted in the same manner as the link 267 shown in Figures 25 and 26.

In the embodiment of Figures 40 and 41 the numeral 456 designates the body plate in which is formed the arcuate slot 457. This slot is formed on the radius of the center or axis of the journal rivet 458 which rivet is, as shown in Figure 41, fixed to the body plate. On this journal rivet is pivotally supported the supporting roller 459.

Positioned in the arcuate slot 457 is the journal 460 through which extends the shaft 431 which is of polygonal cross sectional design whereby the journal and other parts are maintained thereon against rotation.

Upon the left hand or inner side of the body plate there is mounted on the shaft 461, the spacer disk 462 which is in peripheral contact with the roller 459 and at the inner or left hand end of the shaft 461 is fixed the can rim engaging driving wheel 463.

Upon the outer end of the shaft 461 is mounted the eccentric unit consisting of the eccentric journal 464 which is located between the spacer disks 465. Between the inner disk 465 and the body plate is a spacer 466.

The outer end of the shaft 461 has fixed thereto the end of the crank 467 by means of which rotary motion is imparted to the shaft 461 and all of the elements supported thereon.

The numeral 468 designates the eccentric strap which forms a part of the reciprocating thrust link, not shown, which is of the same form as the link 267 shown in Figure 25 . Also used in association with the link is a journal carried by the body plate and corresponding to the journal 272 shown in Figure 25.

In the operation of the tenth embodiment the operating handle or crank 467 is rotated to its rearward position if it is not already in such position where it would normally be at the completion of an operation of removing a can head from a can. When in such position the can driving wheel 463 will be in its lower position by which is meant that the journal 460 will be in the rear lower end of the slot 457. The can is then held with its upper end against the cutter, not shown, and the operating handle 467 is rotated clockwise. During the first half turn of the operating handle 467, the can driving wheel 463 will be moved forwardly and upwardly to approximately the position shown in Figure 40, by the action of the eccentric journal 464 in its action in the eccentric ring or strap 468 which forms the forward end of the described thrust link, not shown, which link as stated is of the same character as the link 267 and mounted at its rear end in the same manner. When the can driving wheel arrives at the raised forward position further forward movement is prevented by engagement of the spacer with a thrust roller 469 which is mounted upon

a pivot rivet 470 secured to the body plate forwardly of the forward end of the slot 457. This roller 469 is, however, not essential to the proper operation of the device but it will be readily apparent that if the roller is not employed then the forward movement of the can driving wheel would be checked by engagement of the journal 460 in the forward end of the slot 457.

Downward thrust on the can driving wheel is taken by the supporting roller 459 which is in engagement with the spacer 462.

Sufficient clearance exists between the journal 460 and the lower edge of the arcuate slot 457 to assure that the journal will never bear on the lower edge of said slot. The spacers 462 and 466 maintain the can driving wheel in alignment at all times. However, the positioning of the rollers 459 and 469 near the lateral plane of the can driving wheel materially reduces lateral operating thrust and friction and promotes ease of operation after the end of the can has been punctured.

Figure 42 illustrates an alternate type of spring which may be used for maintaining a frictional coupling between the eccentric operated thrust link such, for example, as the link 173 or the link 267 and the eccentric journal, in lieu of the spring 184 shown in Figure 16. In this figure the forward end portion of the thrust link is shown and generally identified by the reference character 469a, the eccentric journal encircling strap or ring being designated 470a and corresponding with the straps or rings 446, 446a and 468.

This spring is generally designated 471 and, as shown, it consists essentially of a crossed loop which surrounds the anchor rivet 472 which is secured to the link 469a. The loop of the spring extends forwardly to form the two opposing arms 473 which have the eccentric journal positioned therebetween and which bear at all times upon a substantial portion of the periphery of such journal. The bias of this spring is such that the two opposing arms bear upon the eccentric journal with a predetermined thrust or pressure to cause the eccentric link 469a to tend to turn or rotate with the eccentric journal as a result of the friction between the arms of the spring and the journal.

Figure 43 illustrates a second alternate type of spring which can be used in lieu of spring 184 shown in Figure 16 or the spring illustrated in Figure 42, the second alternate spring being generally designated 474. This spring is of corrugated contour and telescopes over the eccentric journal and is preferably inserted between the strap or ring portion 470a of the eccentric thrust link and the outer spacer disk adjacent to the eccentric link, although one such spring could obviously be inserted on either side of the eccentric link.

I claim:

1. A can opener of the rotary drive wheel type, comprising a body plate, the body plate having an elliptical opening therein, a rock plate pivotally supported by the body plate upon one side thereof for partial turning movement in a plane parallel with the adjacent side of the body plate, the rock plate having a portion overlying said opening, a rotatable shaft supported by the rock plate and extending through said opening, a can rim engaging driving wheel carried by the shaft adjacent to the rock plate, means for imparting rotation to said shaft, said rock plate when turned in one direction effecting the lowering of the driving wheel and when turned in the opposite direction effecting the raising of the driving wheel, a cutter carried by the body plate for coaction with the wheel and toward which the wheel moves upon being raised, and a coupling between the shaft rotating means and the rock plate functioning upon operation of the shaft rotating means in one direction to effect the turning of the rock plate to lower the driving wheel and upon operation of the shaft rotating means in the opposite direction to effect the reverse turning of the rock plate for the raising of the driving wheel.

2. A can opener of the rotary drive wheel type, comprising a body plate, a cutter carried thereby, a rock plate pivoted to the body plate on one side, the body plate having a vertical slot over which the rock plate extends, a shaft carried by the rock plate and extending through said slot, a can rim engaging driving wheel carried by the shaft, an operating handle connected to the shaft on the opposite side of the body plate from the rock plate and wheel whereby rotary motion may be given to the wheel and shaft, and a linkage and escapement mechanism between the handle and the rock plate for establishing an operative coupling between the handle and the rock plate upon rotation of the handle in one direction to turn the rock plate to effect movement of the wheel away from the cutter and upon rotation of the handle in the opposite direction to turn the rock plate to effect movement of the wheel toward the cutter, the escapement of said mechanism being adapted to permit continued rotation of the handle in the said one direction after the wheel is moved to a predetermined position relative to the cutter.

3. A can opener of the rotary drive wheel type comprising a body plate, a cutter carried thereby, the body plate having an elongated opening therein, a rock plate pivoted to one side of the body plate, a shaft carried by the rock plate and passing through the opening and adapted to be moved by the rock plate lengthwise of the opening, an operating handle carried by the shaft, a can rim engaging driving wheel carried by the shaft adjacent to the rock plate for movement relative to the cutter, a shiftable plate carried by the body plate upon the side of the body plate opposite to the rock plate and adapted for movement in a plane paralleling the body plate, a coupling between the handle and the shiftable plate to effect movement of the shiftable plate upon both clockwise and counterclockwise rotation of the handle, a coupling between the rock plate and the shiftable plate through which rocking movement is given to the rock plate upon shifting of the shiftable plate, to effect relative movement of the wheel and cutter, said shiftable plate having an elongated slot, a rivet carried by the body plate and engaging in said slot whereby the shiftable plate is movable relative to the body plate, and the said coupling between the rock plate and the shiftable plate comprising a pivot carried by the shiftable plate, an elongated slot in the body plate through which the pivot passes, a cam slot in the rock plate, and a cam element carried by the pivot and engaging in said cam slot.

4. A can opener of the rotary drive wheel type comprising a body plate, a cutter carried thereby, the body plate having an elongated opening therein, a rock plate pivoted to one side of the body plate, a shaft carried by the rock plate and passing through the opening and adapted to be moved by the rock plate lengthwise of the opening, an

operating handle carried by the shaft, a can rim engaging driving wheel carried by the shaft adjacent to the rock plate for movement relative to the cutter, a shiftable plate carried by the body plate upon the side of the body plate opposite to the rock plate and adapted for movement in a plane paralleling the body plate, a coupling between the handle and the shiftable plate to effect movement of the shiftable plate upon both clockwise and counterclockwise rotation of the handle, a coupling between the rock plate and the shiftable plate through which rocking movement is given to the rock plate upon shifting of the shiftable plate, to effect relative movement of the wheel and cutter, the said coupling between the handle and the shiftable plate comprising a pawl pivotally mounted upon the shiftable plate, an element carried by the handle for engagement with the pawl upon movement of the handle both clockwise and counterclockwise, and spring means coupling the pawl with the shiftable plate and normally maintaining the pawl in a position to oppose counterclockwise movement of the handle beyond a predetermined position but permitting the pawl to yield for continued movement of the handle in the clockwise direction.

5. A can opener of the rotary drive wheel type comprising a body plate, a cutter carried thereby, the body plate having an elongated opening therein, a rock plate pivoted to one side of the body plate, a shaft carried by the rock plate and passing through the opening and adapted to be moved by the rock plate lengthwise of the opening, an operating handle carried by the shaft, a can rim engaging driving wheel carried by the shaft adjacent to the rock plate for movement relative to the cutter, a shiftable plate carried by the body plate upon the side of the body plate opposite to the rock plate and adapted for movement in a plane paralleling the body plate, a coupling between the handle and the shiftable plate to effect movement of the shiftable plate upon both clockwise and counterclockwise rotation of the handle, a coupling between the rock plate and the shiftable plate through which rocking movement is given to the rock plate upon shifting of the shiftable plate, to effect relative movement of the wheel and cutter, the said coupling between the handle and the shiftable plate including a journal secured to the handle eccentric to said shaft, and a strap connected with the shiftable plate and encircling said journal.

6. A can opener of the rotary drive wheel type comprising a body plate, a cutter carried thereby, the body plate having an elongated opening therein, a rock plate pivoted to one side of the body plate, a shaft carried by the rock plate and passing through the opening and adapted to be moved by the rock plate lengthwise of the opening, an operating handle carried by the shaft, a can rim engaging driving wheel carried by the shaft adjacent to the rock plate and adapted to be moved thereby relative to the cutter, a shiftable plate disposed upon the side of the body plate opposite to the rock plate, the shiftable plate having an elongated slot therein, a rivet carried by the body plate and engaging in said slot, the shiftable plate having a recessed top edge in which the shaft lies, a flange integral with the shiftable plate, a contact member carried by the handle and adapted to engage the flange upon clockwise turning of the handle to shift the shiftable plate, a spring pressed pawl carried by the shiftable plate for engagement by said contact member upon counterclockwise rotation of the handle to effect movement of the shiftable plate in the opposite direction, said pawl yielding upon clockwise rotation of the handle to permit passage of said contact member, and a camming coupling between the shiftable plate and the rock plate whereby movement of the shiftable plate by engagement of the contact member with said flange effects vertical movement of the rock plate to move the wheel toward the cutter.

7. A can opener of the character stated in claim 6, wherein the said camming connection between the shiftable plate and the rock plate comprises a pivot stud secured to the shiftable plate, a relatively long straight slot formed in the body plate in the direction of movement of the shiftable plate, an arcuate camming slot formed in the rock plate, and a cam roller mounted upon said stud and engaging in said arcuate cam slot.

8. A can opener of the rotary drive wheel type, comprising a body plate, a cutter carried thereby, the body plate having a relatively long vertically disposed opening therein, a rock plate disposed upon one side of the body plate, the body plate having a second relatively long opening, the second opening extending horizontally substantially perpendicular to the first opening, a cam flange integral with the body plate and disposed below the rock plate, a pivot pin carried by the rock plate and extending through the second mentioned opening, a cam roller carried by the pivot pin and engaging said flange, a shaft carried by the rock plate and extending through the first mentioned opening and adapted to be moved vertically therein upon oscillation of the rock plate, a can rim engaging driving wheel carried by the shaft, an operating handle secured to the shaft upon the opposite side of the body plate from the rock plate, a relatively long shiftable plate disposed upon the opposite side of the body plate from the rock plate, a sliding coupling between one end of the shiftable plate and the body plate, a link connecting the sliding coupling with said pivot pin, means coupling the handle with the other end of the shiftable plate for imparting reciprocatory movement thereto upon clockwise rotation of the handle, and means forming a part of the sliding coupling whereby the shiftable plate has reciprocatory movement independently of the coupling between the sliding coupling and the pivot upon clockwise rotation of the handle and is secured against such independent reciprocatory movement upon counterclockwise rotation of the handle whereby to effect a desired movement of the pivot pin.

9. A can opener of the rotary drive wheel type comprising a body plate, a cutter carried thereby, the body plate having a relatively long opening vertically therein, a rock plate disposed upon one side of the body plate, a rotary shaft carried by the rock plate and passing through the opening and adapted to be moved by the rock plate lengthwise of the opening, an operating handle carried by the shaft upon the side of the body plate opposite from the rock plate, a can rim engaging driving wheel carried by and upon the other end of the shaft and adapted to be moved upon oscillation of the rock plate relative to the cutter, a second relatively long opening formed in the body plate perpendicular relative to the first opening, a pivot pin carried by the rock plate and passing through the second opening, thrust means between the pivot pin and the body plate

for effecting the raising of the rock plate and the shaft upon oscillation of the rock plate in one direction, a slide pin carried by the body plate, a link connecting the slide pin with the pivot pin, a relatively long shiftable plate having a long slot therein at one end terminating in a downwardly directed portion, the slide pin extending through the last mentioned slot, and means coupling the handle with the other end of the shiftable plate whereby longitudinal movement is imparted to the shiftable plate upon rotation of the handle.

10. A can opener of the character stated in claim 9, wherein the last mentioned means comprises a journal secured to the handle eccentrically to the shaft and an eccentric strap forming a part of the slide plate and encircling said journal.

11. A can opener of the character stated in claim 9, wherein the last mentioned means comprises a journal secured to the handle eccentrically to said shaft, an eccentric strap forming a part of the sliding plate and encircling the journal, and spring means between the journal and strap for maintaining a frictional coupling between the same.

12. A can opener of the character stated in claim 9, wherein the said thrust means coupling the rock plate with the body plate, comprises a cam flange integral with the body plate below the rock plate and a roller carried by the pivot pin and contacting said flange.

13. A can opener of the character stated in claim 9, wherein the said thrust means between the rock plate and the body plate comprises a cam flange integral with the body plate, a housing forming a laterally extending portion of the rock plate through which the pivot pin passes, and a cam roller rotatably mounted on the pivot pin and enclosed in said housing between a part of the rock plate and the body plate and having rolling contact with said flange.

14. A can opener of the character stated in claim 9, wherein said thrust means comprises a link pivotally connected at one end with the pivot pin, a pivot rivet coupling the other end of the link with the body plate and the second mentioned relatively long opening being of arcuate form and struck from the center of said pivot rivet.

15. A can opener of the rotary drive wheel type comprising a body plate, a cutter carried thereby, the body plate having a relatively long opening vertically therein, a rock plate disposed upon one side of the body plate, a rotatable shaft carried by the rock plate and extending through said opening and adapted to be moved by the rock plate lengthwise of the opening, an operating handle carried by the shaft, a can rim engaging driving wheel carried by the shaft adjacent to the rock plate and adapted to be moved thereby relative to the cutter, a second relatively long opening formed in the body plate below and perpendicular to the first opening, a pivot pin secured to the rock plate and passing through the second opening, a slide pin connected with the body plate for movement on a path paralleling the second opening, a link coupling the pivot pin with said slide pin, a relatively long shiftable member having one end oscillatably supported on the slide pin, the other end of the shiftable member passing across the underside of said shaft, the said other end of the shiftable member having an upwardly opening notch therein, a stud carried by the handle and adapted to engage in said notch whereby movement of the shiftable member in one direction is effected upon the counterclockwise turning of the handle, spring means urging oscillation of the shiftable member in a direction to engage against the underside of the shaft, and means for limiting the downward swinging of the shiftable member upon the said counterclockwise turning of the handle.

16. A can opener of the rotary drive wheel type comprising a body plate, a cutter carried thereby, the body plate having a relatively long vertical opening therein, a relatively long rock plate disposed upon one side of the body plate in a plane parallel therewith, a pivot rivet between the rock plate and the body plate rearwardly of said opening, a rotatable shaft carried by the rock plate forwardly of said rivet and passing through said opening, a can rim engaging driving wheel secured to the shaft at the end adjacent to the rock plate, a handle secured to the other end of the shaft upon the opposite side of the body plate from the rock plate, a pivot stud carried by the body plate rearwardly of the rock plate, a pivot stud carried by the rock plate below and rearwardly of the pivot rivet, a toggle link coupling said pivot studs together and including two link members each pivoted to a stud and having overlapping end portions and an intermediate pivot pin passing through and pivotally coupling said links, an arcuate slot formed in the body plate and struck from the center of the first mentioned pivot stud and having said intermediate pivot passing therethrough, and means forming a driving coupling between the handle and said intermediate pivot upon the opposite side of the body plate from the rock plate whereby the intermediate pivot is shifted in said arcuate slot to straighten out or break the toggle link to effect rocking of the rock plate and raising or lowering of the driving wheel relative to the cutter.

17. A can opener of the rotary drive wheel type comprising a body plate, a pivot carried by the plate, an arcuate slot formed in the plate and struck from the center of the pivot, a bar mounted to rock on the pivot in a plane paralleling the plate, a pivot pin carried by the bar at one end and extending through the slot, a cutter carried by the pin upon the side of the plate opposite from the bar, a rotary shaft supported by and extending through the plate below the pivot pin, a can rim engaging driving wheel supported on the shaft adjacent to the cutter, means connected to the other end of the shaft for rotating the same, means actuated by the shaft rotating means and operatively coupled to the other end of the bar for effecting oscillation of the bar to move the cutter toward the wheel when the shaft is rotated in one direction and permit continued rotation of the shaft and to reversely oscillate the bar to move the cutter away from the wheel when the shaft is reversely rotated, a rest member pivotally supported upon the body plate upon the side adjacent to the cutter and adapted to engage the top edge of the can rim, and a resilient coupling between the can rest and the bar whereby oscillatory movement of the bar tends to impart corresponding oscillatory movement to the rest.

18. A can opener of the rotary drive wheel type comprising a body plate, a pivot carried by the plate, an arcuate slot formed in the plate and struck from the center of the pivot, a bar mounted to rock on the pivot in a plane paralleling the

plate, a pivot pin carried by the bar at one end and extending through the slot, a cutter carried by the pin upon the side of the plate opposite from the bar, a rotary shaft supported by and extending through the plate below the pivot pin, a can rim engaging driving wheel supported on the shaft adjacent to the cutter, means connected to the other end of the shaft for rotating the same, means actuated by the shaft rotating means and operatively coupled to the other end of the bar for effecting oscillation of the bar to move the cutter toward the wheel when the shaft is rotated in one direction and permit continued rotation of the shaft and to reversely oscillate the bar to move the cutter away from the wheel when the shaft is reversely rotated, a relatively long plate member disposed upon the side of the body adjacent to the cutter and mounted at one end upon the pivot carrying the bar, said plate carrying laterally directed feet between which the cutter is positioned and adapted for engagement with the top edge of the can rim, means forming a loose coupling between the plate and the bar whereby limited relative movement is permitted between the plate and bar, and a spring coupling between the plate and bar yieldingly resisting such relative movement in one direction.

19. A can opener of the rotary drive wheel type comprising a body plate, a pivot carried by the plate, an arcuate slot formed in the plate and struck from the center of the pivot, a bar mounted to rock on the pivot in a plane paralleling the plate, a pivot pin carried by the bar at one end and extending through the slot, a cutter carried by the pin upon the side of the plate opposite from the bar, a rotary shaft supported by and extending through the plate below the pivot pin, a can rim engaging driving wheel supported on the shaft adjacent to the cutter, means connected to the other end of the shaft for rotating the same, means actuated by the shaft rotating means and operatively coupled to the other end of the bar for effecting oscillation of the bar to move the cutter toward the wheel when the shaft is rotated in one direction and permit continued rotation of the shaft and to reversely oscillate the bar to move the cutter away from the wheel when tht shaft is reversely rotated, a can rim engaging rest comprising a relatively long narrow plate member disposed upon the side of the body plate adjacent to the cutter and having one end mounted upon said pivot for swinging movement in a vertical plane independently of the movement of the bar, the body plate adjacent to the other end of the rest plate having an arcuate slot therein, the bar having an arcuate slot paralleling the last mentioned slot, a pin carried by the said other end of the rest plate and passing through the two last mentioned slots, the slot of the bar being of less length than the adjacent plate slot, and a spring coupling between the last mentioned pin and the bar and yieldingly resisting swinging movement of the rest plate independently of the bar.

20. A can opener of the rotary drive wheel type comprising a body plate, a pivot carried by the plate, an arcuate slot formed in the plate and struck from the center of the pivot, a bar mounted to rock on the pivot in a plane paralleling the plate, a pivot pin carried by the bar at one end and extending through the slot, a cutter carried by the pin upon the side of the plate opposite from the bar, a rotary shaft supported by and extending through the plate below the pivot pin, a can rim engaging driving wheel supported on the shaft adjacent to the cutter, means connected to the other end of the shaft for rotating the same, means actuated by the shaft rotating means and operatively coupled to the other end of the bar for effecting oscillation of the bar to move the cutter toward the wheel when the shaft is rotated in one direction and permit continued rotation of the shaft and to reversely oscillate the bar to move the cutter away from the wheel when the shaft is reversely rotated, said last named means comprising a journal secured to the shaft rotating means eccentrically to the shaft, an eccentric strap encircling said journal, a long slide plate connected to the eccentric strap, and a toggle unit coupled between the other end of the bar and the body plate and including a pin member, said slide plate having a long slot therein in which said toggle pin engages.

21. A can opener of the rotary drive wheel type comprising a body plate, a pivot carried by the plate, an arcuate slot formed in the plate and struck from the center of the pivot, a bar mounted to rock on the pivot in a plane paralleling the plate, a pivot pin carried by the bar at one end and extending through the slot, a cutter carried by the pin upon the side of the plate opposite from the bar, a rotary shaft supported by and extending through the plate below the pivot pin, a can rim engaging driving wheel supported on the shaft adjacent to the cutter, means connected to the other end of the shaft for rotating the same, means actuated by the shaft rotating means and operatively coupled to the other end of the bar for effecting oscillation of the bar to move the cutter toward the wheel when the shaft is rotated in one direction and permit continued rotation of the shaft and to reversely oscillate the bar to move the cutter away from the wheel when the shaft is reversely rotated, said last named means comprising a journal secured to the shaft rotating eccentrically to the shaft, an eccentric strap encircling said journal, a long slide plate connected to the eccentric strap, a toggle unit coupled between the other end of the bar and the body plate and including a pin member, said slide plate having a long slot therein in which said toggle pin engages, said slot having an angular extension at one end, and a spring means between the journal strap for maintaining a frictional coupling between the same.

22. A can opener of the rotary drive wheel type, comprising a flat body plate, two relatively movable elements consisting of a cutter and a rotary drive wheel, one element being supported on the body plate, a rock plate pivoted on the body plate on one side thereof, the other element being supported on the rock plate to be moved thereby toward and away from the said one element, a crank connected with the wheel element for rotating the same, a slide member supported at the opposite side of the body plate for back and forth shifting movement, an operative coupling between the slide member and the rock plate by which movement of the slide member back and forth transmits oscillatory movement to the rock plate to move the elements together and apart, cooperating elements for coupling the crank with the slide member by which the slide member is shifted upon rotation of the crank in either direction, and means for limiting the turning movement of the crank and the sliding movement of the slide member in a direction for turning the rock plate in a direction to separate the elements and for permitting continuous turn-

ing in the opposite direction after a predetermined turning of the crank in the first stated direction and reverse shifting of the slide member to reversely turn the rock plate and effect movement of said elements together.

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