April 21, 1925. 1,534,932

H. J. EDLUND

CAN OPENING DEVICE

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Fig. 1.

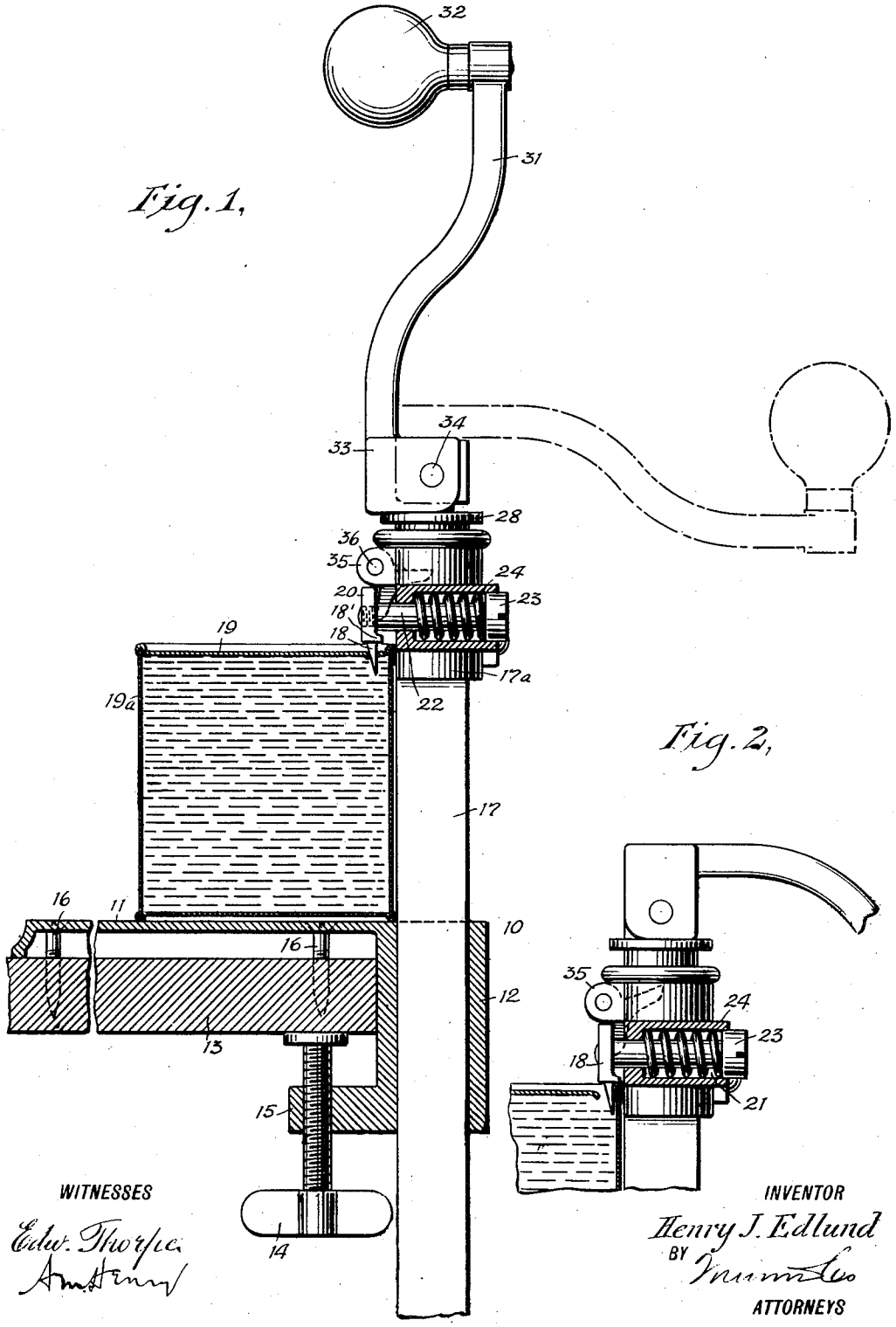


Fig. 2.

WITNESSES

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Fig. 3,

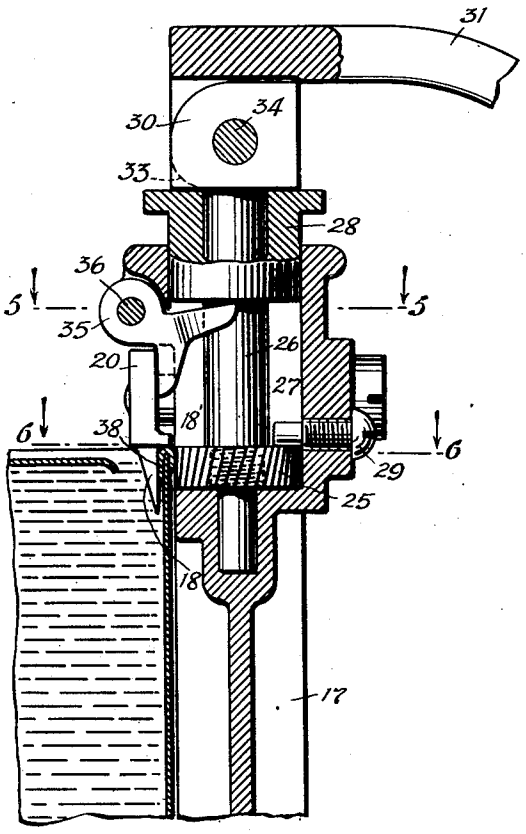


Fig. 4,

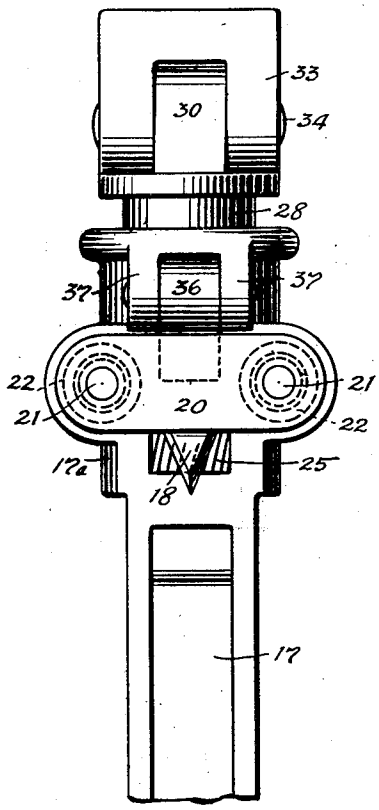


Fig. 5,

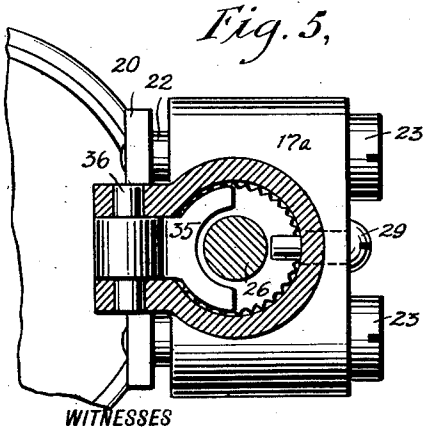
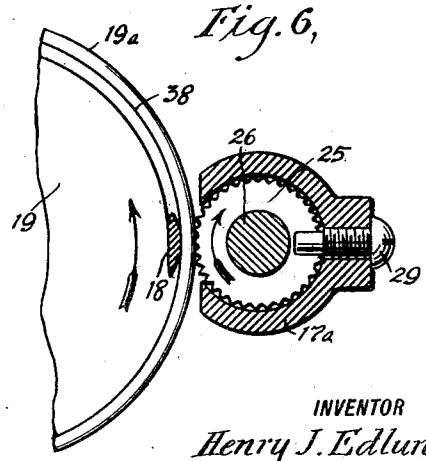


Fig. 6,



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Fig. 7.

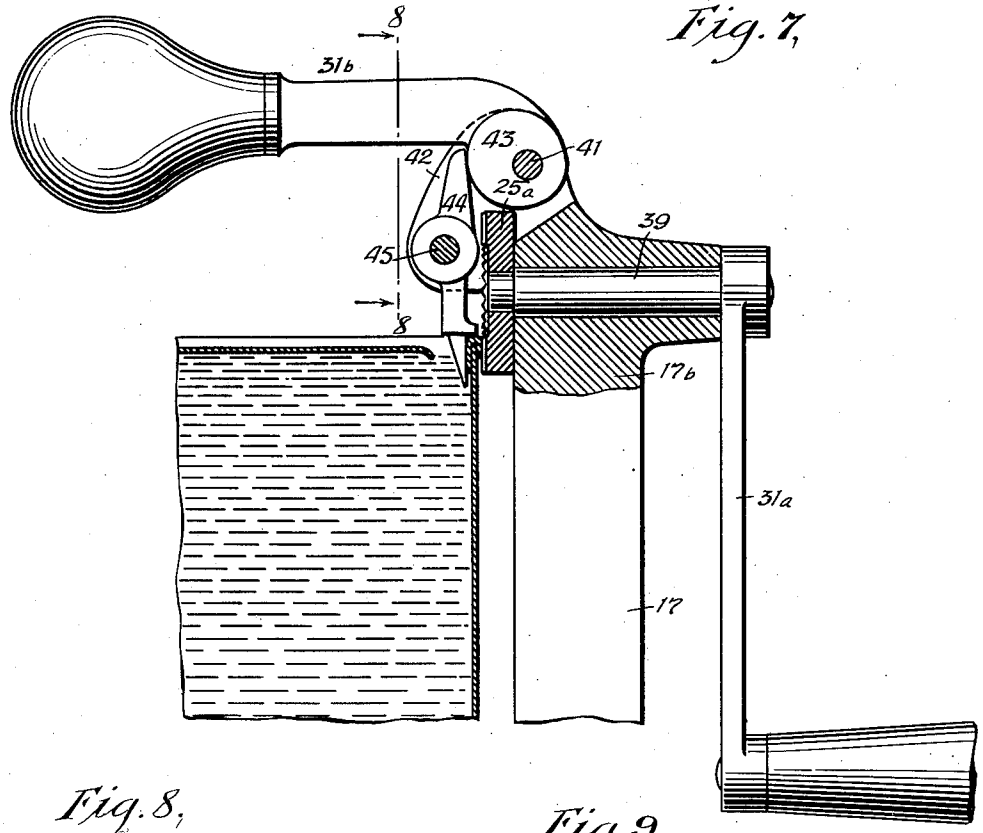


Fig. 8.

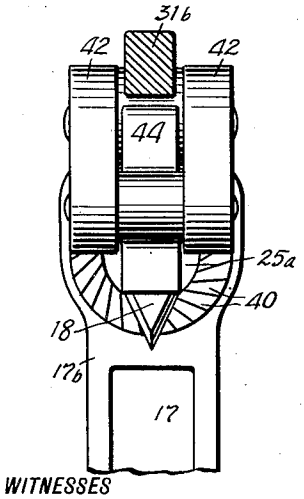
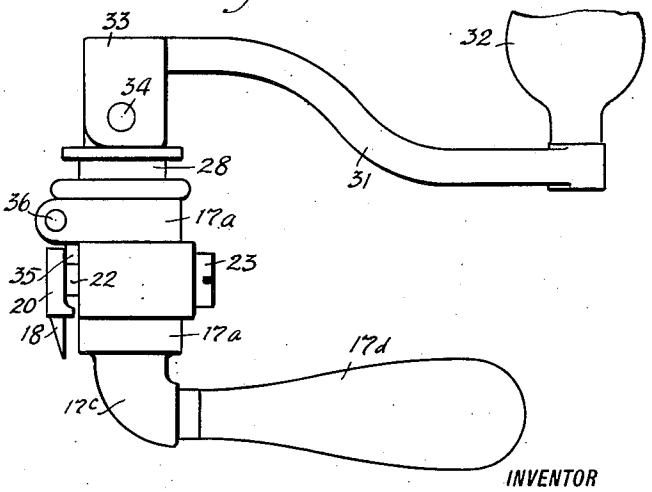


Fig. 9.



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UNITED STATES PATENT OFFICE.

HENRY J. EDLUND, OF BURLINGTON, VERMONT.

CAN-OPENING DEVICE.

Application filed December 19, 1922. Serial No. 607,849.

To all whom it may concern:

Be it known that I, HENRY J. EDLUND, a citizen of the United States, and a resident of Burlington, in the county of Chittenden and State of Vermont, have invented a new and Improved Can-Opening Device, of which the following is a full, clear, and exact description.

This invention relates to can-openers, and more particularly aims to provide a new and improved apparatus for the purpose, adapted rapidly and completely to sever a can top exceedingly close to the side wall or walls of the can, so that the entire contents of the can may be discharged merely by inverting the latter.

Another object is to provide an apparatus for thus removing the can cover, and in such a way as to permit such discharge of the contents to be had without causing any damage or even blemish to solid objects forming parts of such contents, as sections of fruit, small fish, or the like.

Another object is to sever the can top as described irrespective of whether or not the cross-section of the can is circular and irrespective of the depth of the can, so that, for example, the new device will act with great efficiency and as described in regard to removing completely the top of a shallow substantially sharp-cornered sardine can of the familiar type.

An exceedingly important object is to provide a can-opener operable as above and adapted during the top-severing operation, to squeeze and smooth over the severed edge at the top of the inside of the can, so as absolutely to preclude any chance of cutting or injuring any person handling the can, full or empty, subsequent to a removal of the top by the cutting blade of the device.

Still another object of the invention is to provide a device of the kind above characterized comprising few parts, and these parts of simple construction, so that the device may be manufactured at comparatively small expense, and yet a device very rugged, to give long life, and convenient, rapid and easy to manipulate in regard to cans of practically all transverse shapes, to permit even a child to use the device while attaining all the objects and satisfying all the advantages above indicated.

With these and various other objects in view, the invention consists in certain novel features of construction, and combinations and arrangements of parts, as will be hereinafter described more in detail, and precisely and definitely pointed out in the claims.

In the accompanying drawings, which show by way of example, several possible structures according to the invention as at present preferred, but of course constituting merely illustrative embodiments thereof,

Fig. 1 is a view partially in side elevation and partially in vertical section, showing one of said embodiments, when the full line parts are disposed for first causing the cutting blade to pierce a can cover at a point removed somewhat from the line of severing to be performed to remove the cover completely from the can;

Fig. 2 is a fragmentary detail, showing certain of the parts of Fig. 1, but redisposed to arrange the blade and can for such severing;

Fig. 3 is an enlarged detail view, partially in elevation and partially in section, showing more clearly the blade-adjacent parts;

Fig. 4 is a view similar to Fig. 3, but wholly in elevation and looking to the left in Fig. 3;

Fig. 5 is a transverse section taken on line 5—5 of Fig. 3;

Fig. 6 is a similar section taken on line 6—6 of Fig. 3;

Fig. 7 is a view similar to Fig. 3 but showing another embodiment;

Fig. 8 is a vertical section, taken on line 8—8 of Fig. 7; and

Fig. 9 is a side elevation of still another embodiment.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring now mainly to Figs. 1 to 6, a support 10 including a plane table 11 and a depending sleeve 12, is adapted to be set over and against the outer edge of a table 13 or the like as by means of a clamp screw 14 threaded upward in a tapped hole in an offset lug 15 at the bottom of sleeve 12. If desired, the support 10 may be further anchored to the table-top as by means of suitably spaced wood screws as indicated at 16.

The vertical bore of sleeve 12 is preferably square in cross-section, to mount loosely therein a vertically slidable post 17, such

post being desirably of H-shaped cross-section as indicated in Figs. 3 and 4, to prevent rotation of the post in the sleeve and yet to minimize friction so that the weight of the parts carried at the top of the post will always tend to cause the post freely to descend to force the cutting blade 18 toward a piercing contact with the cover 19 of a can 19ª so that thereupon the post and blade may be further forcibly depressed to cause the blade to pierce the cover as shown in Fig. 1.

This blade 18, having a lowermost piercing point, upwardly inclined cutting edges above the point and a flat portion at its face directed toward the post 17, all as shown in Figs. 4 and 6, depends below the middle of a cross-plate 20. Plate 20 has a pair of thrust-rods 22 horizontally offset therefrom, as by the threaded connection illustrated in Fig. 1. These rods extend through suitable bores in the shaped head 17ª of the post, such bores being enlarged toward the outer ends of the rods to provide an annular chamber 21 surrounding a length of each rod ahead of its terminal screw-head 23. In these chambers are interposed rather stiff expansile coil springs 24. The normal effect of such springs is always to forcibly urge the flat portion of the blade toward the position shown in Fig. 3, during the main operation of rotating the can relative to the blade for severing the can top.

The means for causing the can top to turn on the top of plate 11, while the cutting blade remains arranged as shown in Fig. 3 relative to the side wall of the can, and thus while always keeping a lengthwise line of the can exterior parallel to post 17, includes, in combination with said plate, a rotor 25. In the present case, said rotor is a disk having a comparatively wide periphery concentrically cylindrical about the vertical axis of the rotor.

The can-feeding rotor is threadedly mounted as indicated in Fig. 3 on a shouldered vertical shaft 26 journalled at its lower reduced end in a vertical bearing forming a central downward prolongation of a plunger chamber 27 in the post head on a level with cross-plate 20 supporting the cutting blade and lying between thrust-rods 22 carrying said cross-plate. The bottom face of rotor 25 resting on the bottom of the plunger chamber, and the plunger shaft having slidingly and slippingly sleeved thereon as shown a cylindrical plunger 28 loosely set in chamber 27 for a sliding and turning fit, it will be seen that shaft 26 and rotor 25 are freely but nicely revoluble in the post head, the plunger is reciprocable on said shaft, and shaft and rotor are very simply locked into their appointed fields of operation by means merely of a single screw 29 shaped and mounted as shown; while the plunger is held against disengagement in an upward direction from the shaft 26 by means of a cross-block 30 rigidly carried atop said shaft.

In order to provide means for turning shaft 26 and rotor 25, a handle 31 is provided in the form of a crank arm carrying at one end a rotary knob 32 and at the other a bifurcated head 33 embracing block 30 on top of shaft 26 and pivotally connected to such block by a cross-pin 34, so that the handle may be thrown to the broken line position of Fig. 1 preparatory to such turning operation.

The cylindrical surface of rotor 25 has inclined ribs or teeth of the cross-section illustrated in Fig. 5, so as to successively individually bite into the outer surface of the side wall of the can, as into the outer portion of the cover-bead shown clearly in Fig. 3, thereby to rotate the can relative to an upwardly inclined side cutting edge of blade 18 when the rotor is turned, as indicated by the arrows drawn in Fig. 6.

The present embodiment being particularly designed for use with a can having its cover affixed at the cannery to establish such bead, the toothed periphery of rotor 25 need not, pursuant to the construction illustrated, protrude beyond the adjoining face of the post-head; and in that case the rotor itself and the upper surface of plate 11 furnish an efficient and adequate can-positioning means for the preliminary piercing of the can cover, intended to result from a downward pressure on the knob 23 when handle 31 is disposed as shown in full lines in Fig. 1,—the pressure required being comparatively light in view of the action of gravity on the freely vertically slidable post 17.

In order to provide means for temporarily holding the piercing point of the cutting blade 18 removed a short distance from the inner surface of the side wall of the can during such piercing operation, the following parts are provided: A bell-crank lever 35 is hung loosely on a cross-pin 36 supported in lugs 37 at opposite sides of an open portion of the plunger chamber 27. This lever has a substantially horizontal fork-arm embracing shaft 26 and underlying plunger 28 and a pendant arm as illustrated in Figs. 1 and 3, the latter arm adapted to play through such opening in chamber 27, and to bear against the flat rear face of the cross-plate 20 which carries the cutting blade, with the blade arranged relative to the can top as shown in Fig. 1 or as shown in Fig. 3 according as the handle 31 is disposed as shown in full lines or in broken lines in Fig. 1. This result is attained due to the cam-formation of the head 33 of the handle; it being apparent from the drawing that when the handle is swung down, the plunger 28 will be depressed on shaft 26

to force down the upwardly canted arm of the bell crank lever 35 and thus throw the cutting blade to the position shown in Fig. 3 against the opposition of springs 24; and when the handle is upright, said springs will force the parts to the locations shown in Fig. 1.

Finally, it should be pointed out that the cutting device formed by blade 18 and cross-plate 20 carries a rearward projection 18', this for the important purpose of preventing the can from ever having any tendency to slide up above rotor 25.

Operation.—Handle 31 having been thrust to the full line position of Fig. 1, to dispose cutting blade 18 spaced slightly more than normally from the head of post 17, the post and all its carried parts are slid upward, and a can 19ª of any cross-sectional shape previously set on plate 11, is slid horizontally over the plate to rest a point on its periphery, as a point on the cover bead, against rotor 25. The post is then jammed down, with the result that the point of the cutting blade pierces the can top as shown in Fig. 1. Next the handle 31 is swung to the position of Fig. 3, thus releasing the plunger to be lifted slightly by the bell crank lever 35, and so permitting said bell crank lever to swing on its pivotal pin and the springs 24 to move the cutting blade radially outward through the material of the can-top to turn and flatten down the starting point of the turn-over edge of the opened can-mouth as indicated at 38 in Figs. 3 and 6. As soon as the handle is thus swung to its horizontally offset position, the same is turned rapidly, the can is whirled at a corresponding speed around the cutting blade as an axis, and the cover is found to be completely severed, while the severed edge of the cover at the can mouth is found to be crimped down flat and tight and close against the inner surface of the side wall of the can. All that is required now to remove the can, contents, and severed top, is to lift the post 17 a slight distance corresponding to the length of the cutting blade, and sidewisely slide the can off plate 11

Referring now particularly to Fig. 7, showing a modified form of the apparatus, it may be explained that the cutting blade 18 there shown is precisely similar to the blade of Fig. 1, and is adapted to be employed to make a first puncture of the can top and then to be employed on a can when fed relative to the same to completely sever the can top and crimp down the part of the can top left attached to the can body, as in the case of the cutting blade of Fig. 1. In the present case, however, a rather simpler mechanical construction is provided than that of Fig. 1, but a construction involving the employment of a plurality of handles. Also, the rotor 25ª employed may be one fixed on a horizontal shaft 39 journalled in the upper portion of the head 17ᵇ of post 17. Shaft 39 and rotor 25 are turned by handle 31ª limited solely to that function. Rotor 25, being on a horizontal axis, has an annular portion of one of its sides equipped with a circumferential series of teeth marked 40 in Fig. 8, these teeth being struck preferably along lines at an angle to the radii of the disk constituting the rotor.

Additional to the rotor actuating handle 31ª, there is provided a blade-setting handle 31ᵇ. Handle 31ᵇ is pivoted on a horizontal cross-pin 41 set in lugs 42 forming the extreme upper end of head 17ᵇ of the post. Handle 31ᵇ is laterally enlarged in the vicinity of pin 41, such enlargement being shaped as shown best in Fig. 7 to constitute a cam 43. The cam-follower for element 43 is the upper arm of a lever 44 pivoted on a cross-pin 45 also set in said lugs 42; and the lower arm of said lever carrying rigidly below the same, the cutting blade 18.

As to the operation of the construction shown in Fig. 7, it will be readily understood that when handle 31ᵇ is swung to an upright position the weight bias of lever 44 will space the piercing point of plate 18 sufficiently away from rotor 25ª to permit the can top to be preliminarily pierced as hereinabove described when post 17 and its carried parts are jammed down toward the closed can. As soon as the can top is thus pierced, handle 31ᵇ is swung back to the position illustrated, whereupon cam 43 forcibly locks lever 44 to dispose the parts as shown. Thereupon a rotation of handle 31ª severs the can top completely from the can body and crimps down flat the extra material at the upper inner portion of the opened can; exactly as in the case of the device of Fig. 1.

The embodiment of Fig. 9 has parts corresponding to those of the construction of Fig. 1, as indicated by the reference characters applied, except that the plate 11 and associated clamping means are dispensed with, as is also the post below post-head 17ª, there being instead provided an elbow extension 17ᶜ and a fixed handle 17ᵈ. That is to say, the can-opening device of the present invention may also be made to be held in the hand instead of being steadied by a fixture similar to the sleeve 12 of Fig. 1.

It will thus be seen that there has been provided a can-opening device well adapted to attain the objects and advantages hereinabove stated and indicated, and particularly adapted to overcome the disadvantages of similar devices as heretofore proposed.

Inasmuch as many changes could be made in the above construction, and many apparently widely different embodiments of my invention could be made without departing from the scope thereof, it is intended that all matter contained in the above de-

scription or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It will also be understood that the language used in the following claims is intended to cover all the generic and specific features of the invention herein described and all statements of the invention which, as a matter of language, might be said to fall therebetween.

I claim:

1. In a device of the character described, a support, a friction rotary member mounted on the support, a vertically movable blade positioned adjacent the periphery of the rotary member, means for moving the blade downwardly to puncture the head of a can at a distance from the side wall of the can, and means to urge the blade toward said side wall and thereby force the can into engagement with the rotary member.

2. In a device of the character described, a support, a friction rotary member, mounted on the support, a vertically movable blade positioned adjacent the periphery of the rotary member, means for moving the blade downwardly to puncture the head of a can at a distance from the side wall of the can, and compression springs for urging the blade toward the side wall of the can and thereby force the can into engagement with the rotary member.

3. In a device of the character described, a support, a friction rotary member mounted on the support, a blade positioned adjacent the periphery of the rotary member, said blade being vertically movable and thereby adapted to be utilized for puncturing the head of a can and thus bring the side wall of the can between the rotary member and blade, means for urging the blade toward the rotary member, and manually operative means adapted to maintain the blade a predetermined distance from the outer periphery of the rotary member during the downward movement of the blade for puncturing the head of a can.

4. In a can-opener, the combination of a support, a structure including a post vertically slidable in said support, a can engaging and feeding rotor vertically journaled in said structure, a handle for turning said rotor and actuable in a field of operation at one side of the rotor, a vertical blade having a lowermost piercing point and carried by said structure, a movable mounting for said blade, spring means for said mounting normally to hold the blade predeterminedly spaced from the rotor, and means for moving and holding said blade at another distance from said rotor than such spacing.

5. In a can-opener, the combination of a support, a structure including a post vertically slidable in said support, a can engaging and feeding rotor on said structure, a handle for turning said rotor and actuable in a field of operation at one side of the rotor, a blade having a lowermost piercing point and carried by said structure, a movable mounting for said blade, spring means for said mounting normally to hold the blade predeterminedly spaced from the rotor, and cam-means for moving and holding said blade at another distance from said rotor than such spacing.

6. In a device of the character described, a vertically movable support, a shaft journaled thereby, a friction wheel carried by the shaft, a laterally movable cutter carried by the support and spaced from the periphery of the friction wheel, said cutter being adapted to be forced through the head of a can thereby bringing the side wall of the can between said cutter and friction wheel, a handle carried by the shaft, said handle being adapted for swinging movement with relation to the shaft, and means whereby upon bringing the handle to a predetermined position the cutter will be pressed outwardly with relation to the friction wheel.

7. In a device of the character described, a vertically movable support, a shaft journaled thereby, a friction wheel carried by the shaft, a laterally movable cutter carried by the support and spaced from the periphery of the friction wheel, said cutter being adapted to be forced through the head of a can thereby bringing the side wall of the can between said cutter and friction wheel, a handle carried by the shaft, said handle being adapted for swinging movement with relation to the shaft, and means whereby upon bringing the handle to a predetermined position the cutter will be pressed outwardly with relation to the friction wheel, and spring means adapted to constantly urge the cutter toward the friction wheel.

8. In a device of the character described, a rotary friction wheel, a vertically movable carrier operable adjacent the friction wheel, a blade on the carrier, manual operative means for moving the blade carrier downwardly to cause the blade to puncture the head of a can at a distance from the side wall of the can, means for rotating the friction wheel, and means for pressing the carrier and blade horizontally, whereby the can will be forced into engagement with the friction wheel, and the severed edge of the can head bent over the top of the can.

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