March 21, 1950 E. G. BOUCHER 2,501,204

PRY TYPE JAR CAP REMOVER

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Fig. 1.

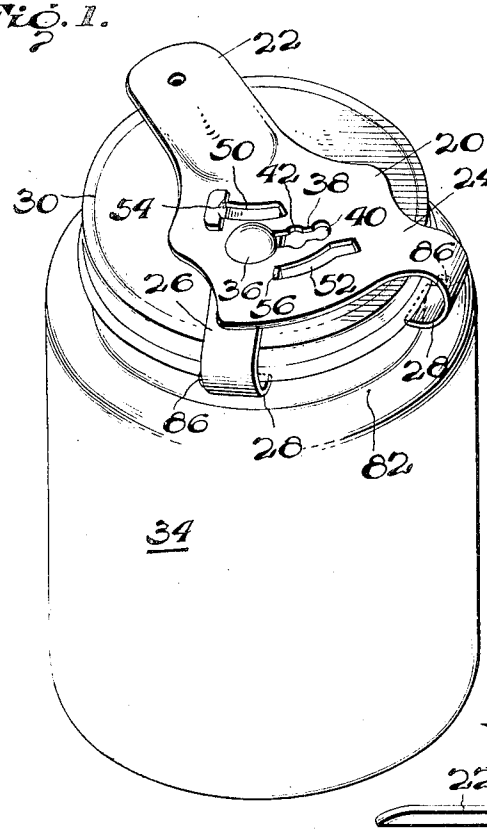


Fig. 2.

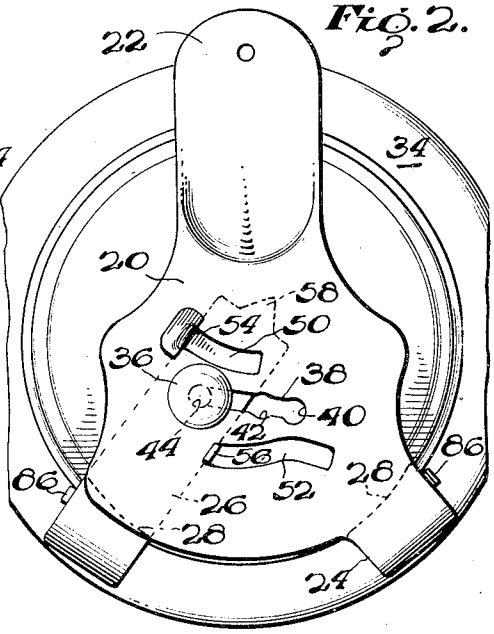


Fig. 3.

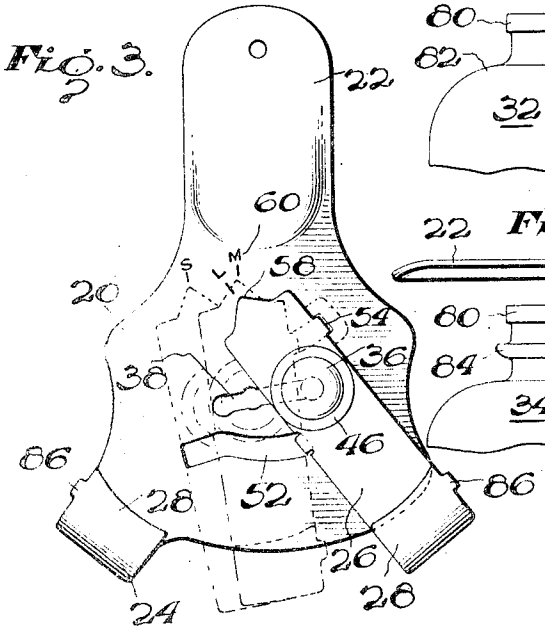


Fig. 4.

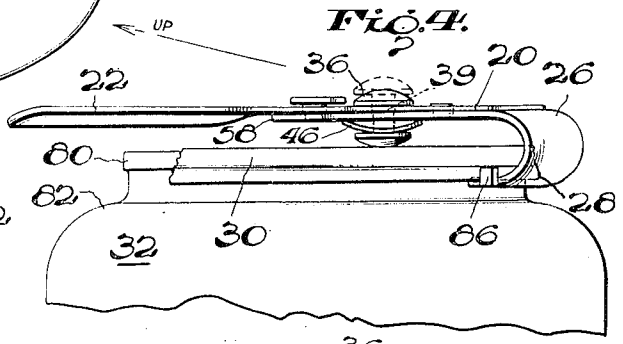
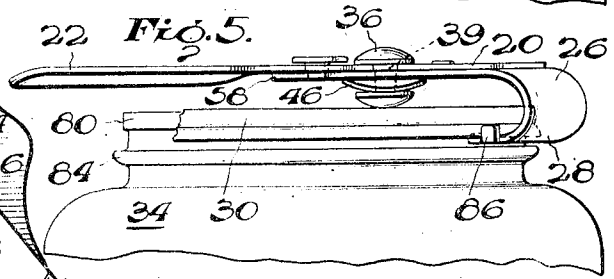


Fig. 5.



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PRY TYPE JAR CAP REMOVER

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Fig. 6.

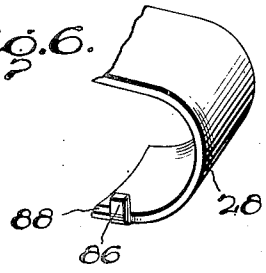


Fig. 7.

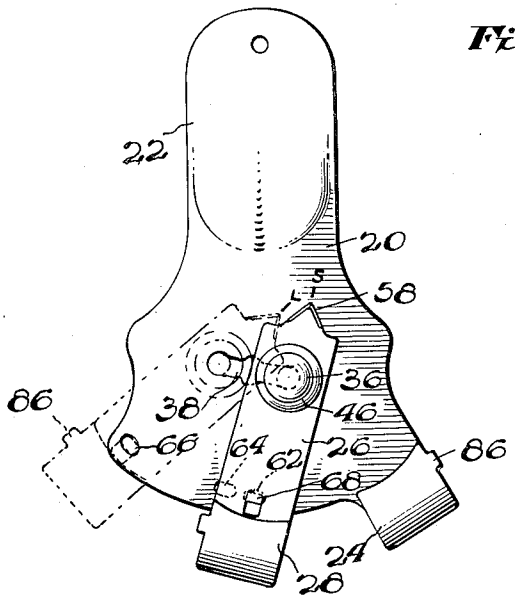


Fig. 10.

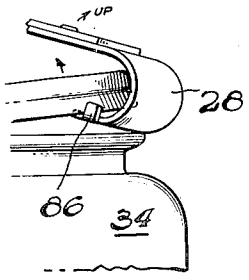


Fig. 9.

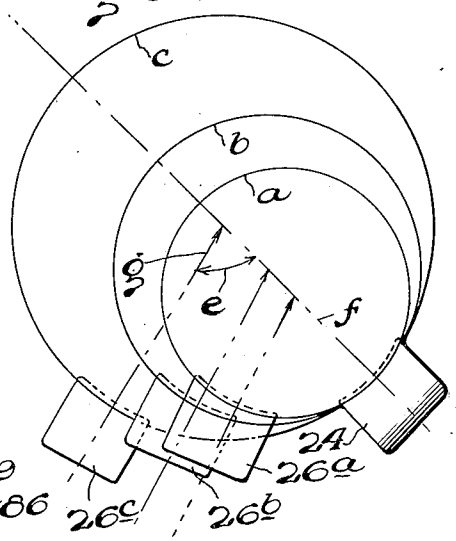
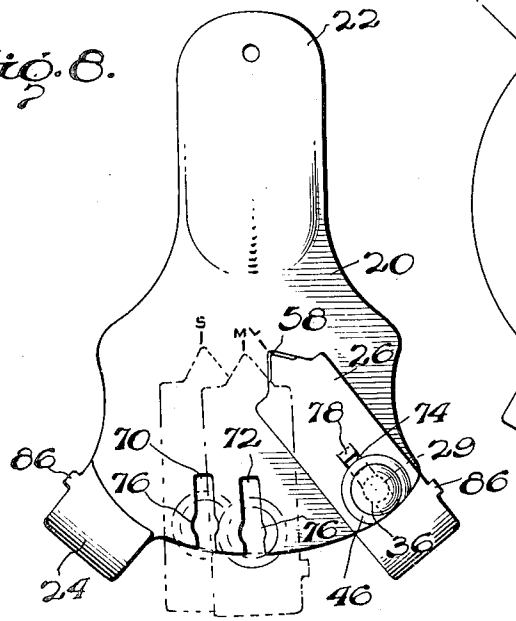


Fig. 8.



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PRY TYPE JAR CAP REMOVER

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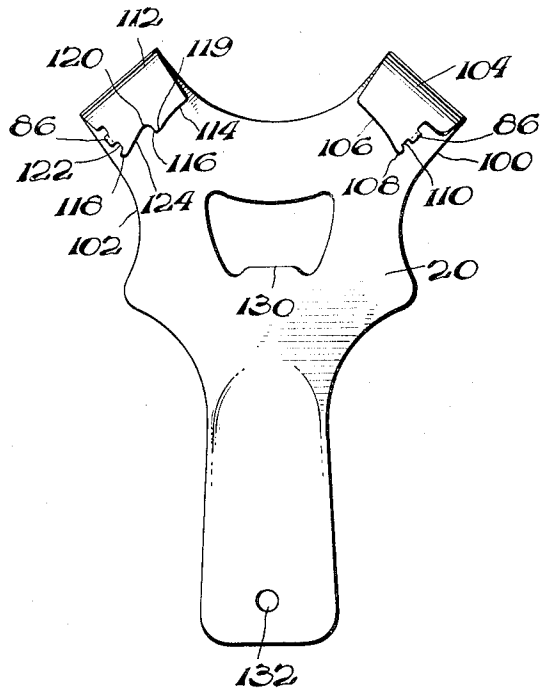


Fig. 11.

Fig. 12.

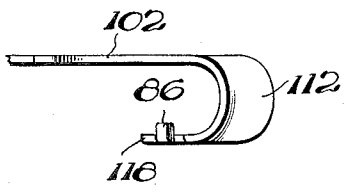
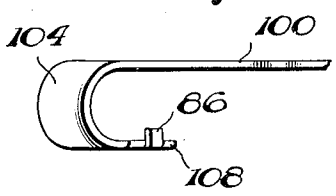


Fig. 13.



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UNITED STATES PATENT OFFICE

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PRY TYPE JAR CAP REMOVER

Emile G. Boucher, Baltimore, Md.

Application February 15, 1946, Serial No. 647,900

5 Claims. (Cl. 81—3.46)

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This invention relates to devices for removing caps or lids of jars and other containers and more particularly to a device or tool which is capable of ready adjustment for removing caps from jars of different sizes.

It has heretofore been known to provide jars, bottles and the like with a pressed-on type of cap or lid which includes an internal gasket adapted to embrace the rim of the jar when assembled thereon. In most instances, vacuum within the jar maintains the cap in closed position in order to hermetically seal the contents. To remove caps of the above type, various types of prying tools have heretofore been utilized, such as table knives, screw drivers, spoon handles, backs of can openers and other types of devices which were adapted to be inserted between the lower edge of the cap and the flange of the container, and thereafter twisted and moved upwardly to pry off the cap. It has been found however, that the tools and devices previously proposed have not been entirely satisfactory, especially in those instances where it is desired to recap the container where only a part of the contents have been used. In such case the use of the prior devices has caused the thin gauge metal cap to be bent entirely out of shape, thereby preventing replacement or has broken or nicked the annular bead on the glass jar, causing the user to discard the jar and place the contents in another container. A further difficulty of the prior devices resided in the large amount of physical effort which was required to remove the caps.

It is accordingly one of the objects of the present invention to provide a novel jar cap removing tool which will be so constituted as to avoid the foregoing difficulties and disadvantages.

Another object of the invention is to provide a novel jar cap remover tool which is arranged to readily remove caps with a minimum of effort.

Still another object is to provide a cap remover of the above type which may be effectively used to remove caps without any danger of bending or distorting the caps, such an arrangement being highly desirable where the jar is to be recapped after removal of a part of the contents thereof.

A further object comprehends a novel construction for a jar cap removing tool which includes an adjustable feature in order that the tool may be quickly and efficiently adjusted for the removal of caps from jars of different sizes.

A still further object includes the provision of a prying tool for removing jar caps, the same being provided with a pair of relatively adjustable arms

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which are so arranged as to be readily adapted to fit caps of various sizes.

Still another object is to provide a tool of the above character which is provided with a novel arrangement of prying teeth or lips which are so arranged that the tool may effectively remove caps from jars of different sizes without the necessity of varying the spacing of the arms of the tool.

Another object is to provide the arms of the aforesaid prying tool with a novel curved lip construction, opposite edges of which respectively coact with the lower edge of the rim of the cap, and the shoulder or flange of the jar, in order to materially reduce the manual effort required, and to avoid any distortion of the cap, during removal of the latter.

Other objects and novel features of the invention will appear more fully hereinafter from a consideration of the following detailed description when taken in connection with the accompanying drawing which illustrates several embodiments of the invention. It is to be expressly understood however, that the drawing is utilized for purposes of illustration only and is not designed as a definition of the limits of the invention, reference being had for this purpose to the appended claims.

Referring to the drawings wherein similar reference characters refer to similar parts throughout the several views;

Fig. 1 is a perspective view of a tool embodying the principles of the present invention, associated with a glass jar of conventional construction;

Fig. 2 is a plan view of the tool of Fig. 1;

Fig. 3 is a plan view of the reverse or under side of the tool of Fig. 1;

Figs. 4 and 5 are side views of the tool of Fig. 1, associated with two different but conventional types of glass jars;

Fig. 6 is a partial perspective view of the inturned lip provided on the arms of the tool of Fig. 1 and on the arms of the tools of the other modifications;

Fig. 7 is a plan view of the under side of a modified form of tool;

Fig. 8 is a plan view of the under side of still another modified form of tool;

Fig. 9 is a diagram illustrating the relationship between the arms of the tool when adjusted for caps of different sizes;

Fig. 10 is a partial perspective view of one of the arms of any of the tools, when the cap of Fig. 5 has been partially removed;

Fig. 11 is a plan view of still another form of the invention wherein the arms of the tool are rigid with the body thereof, and

Figs. 12 and 13 are partial side views of the two arms of the tool of Fig. 11.

Referring more particularly to Figs. 1–5, a novel jar cap remover embodying the principles of the present invention is illustrated therein as comprising a tool 20, provided with a handle 22 and a pair of relatively adjustable arms 24 and 26. Each of the latter is so formed as to provide an inturned lip 28 adapted to be positioned beneath the cap 30 of a jar 32 or 34, see Figs. 4 and 5, and the construction is such that upon upward movement of the handle 22, as viewed in these figures, the cap 30 will be readily and quickly removed without marring or distorting the same.

In order that the tool 20 may be readily adapted for the efficient removal of caps from jars of different sizes, a novel construction is provided by the present invention which enables one of the arms of the tool to be adjusted with respect to the other arm. More particularly, and in the form illustrated in Figs. 1–5, the arm 26 is formed separately from the tool 20 and is adjustably secured thereto, as by means of a rivet 36 which extends through an opening in the arm and also through a rivet slot 38 in the tool 20. As shown more particularly in Figs. 4 and 5, the rivet 36 is provided with an enlarged shoulder 39 immediately beneath the top thereof, which is adapted to be snugly received within enlarged openings 40, 42 or 44 formed in the rivet slot 38. Normally, a dished spring washer 46 of suitable form, cooperates with the rivet 36 to move the latter downwardly, as viewed in Figs. 4 and 5 to maintain the shoulder 39 within one of the openings 40, 42 or 44. However, when it is desired to adjust the position of the arm 26, it is only necessary to push upwardly on the bottom of the rivet 36 to compress the spring washer 46 and remove the shoulder 39 from the opening in the rivet slot 38. Thereafter, the arm 26 is moved to its new position whereupon the spring washer 46 causes the rivet to be snapped into its new locking position when the shoulder 39 registers with the new opening in the rivet slot.

One of the features of the present invention resides in adjusting the tool in such manner as to locate the arms in such relative positions as to require a minimum of effort in removing caps from jars of different sizes. Such variations in adjustment are also such that the inturned lips 28 of the arms 24 and 26 efficiently cooperate with the jar caps of different size jars. These features may be more readily understood by reference to the diagrammatic illustration shown in Fig. 9 wherein the three circles *a*, *b* and *c* indicate the mouths of three conventional jars of different sizes and the adjusted positions of the adjustable arm 26 for the small, medium and large jars is indicated at 26*a*, 26*b*, and 26*c*. It will be readily seen, from this figure that the angle *e* between the center lines *f* and *g* of the respectime arms 26 and 24, is substantially the same, regardless of the adjustment of the arm 26 for jar caps of different sizes. It has been found that with such an arrangement, the arms are correctly spaced to remove jar caps with a minimum of effort and that the lips 28 are also properly positioned for effective cooperation with the different size caps. In addition, breakage of the jar and mutilation of the cap is avoided.

The foregoing desirable results are secured in the form shown in Figs. 1–5 by providing a pair

of guide slots 50 and 52 in the tool 20 with which tongues or lugs 54 and 56, carried by the adjustable arm, respectively cooperate. As shown more particularly in Fig. 3, where the positions of the arm 26 for medium and small size jars are illustrated in dotted lines, the slots 50 and 52 are so shaped as to properly position the arm to secure the angularity referred to above. Also, as illustrated in Fig. 3, the adjustable arm 26 may be provided with a pointer 58 for cooperation with suitable indicia 60 for indicating to the user, the positions of the arm for large, medium and small jars. Preferably, the lug 54 may be provided with a widened head, as shown in order to avoid any possibility of the lugs 54 and 56 being removed from their associated slots during manipulation of the tool.

A slightly modified form of the invention is illustrated in Fig. 7 and is identical with the modification previously described except that the guide slots 50 and 52 have been omitted. In lieu of the latter, the tool 20 is provided with three openings 62, 64 and 66 which are adapted to receive a downwardly extending lug 68 which is struck out of the arm 26. It will be understood that other types of projections such as a stud or a pin may be used in place of the lug 68, it only being necessary that the arm 26 be provided with some type of projection which is adapted to be snugly received within the openings 62, 64 or 66, when the arm 26 is adjusted for small, medium or large jars. It is desired to point out that the openings 62, 64 and 66 are so arranged with respect to the rivet slot 38 and the enlarged openings therein that when the arm 26 is adjusted to any one of its three positions, the two arms of the tool occupy the desired angular relationship as heretofore pointed out in connection with Fig. 9 and Figs. 1–5.

In Fig. 8, a further modified form is illustrated wherein the movable arm 26 is so constituted as to be removable from the tool when adjustment is required. As shown, the tool is provided with three slots 70, 72 and 74 adjacent its outer edge, each of which is provided with an enlarged portion 76 for receiving the shoulder 29 of the stud 36, it being understood that the latter includes a spring washer 46 as in Fig. 4. A struck-out lug 78, or other suitable type of projection is carried by the under side of the arm 26 and is adapted to be received in the slots 70, 72 or 74, it being understood from this construction that with the parts in the full line position indicated, the arm 26 is firmly attached to the body of the tool and the latter is adjusted for removing caps from jars of large size. To adjust the tool for jars of small or medium size, it is only necessary to press downwardly on the head of the rivet 36 to compress the spring 46 and move the shoulder 29 out of the enlarged portion 76 of the slot 74. As soon as this occurs, the arm 26 may be removed and assembled in either of the slots 70 or 72. Thus by an exceedingly simple adjustment, the arm 26 may be quickly positioned in the desired slot for adapting the tool for different size jars. It will be understood that the slots 70, 72 and 74 are so arranged in the body of the tool as to secure the desired angular relationship between the arms 26 and 24 as has heretofore been pointed out in connection with the other modifications.

Referring to Figs. 4 and 5, it will be noted that the jars 32 and 34 are provided with flanges 80 adjacent the mouths thereof, it being understood that the yieldable gaskets carried by the caps, cooperate with such flanges to provide the seal

for the jars. Due to the use of such flanges, it has been found that with the openers heretofore provided, the top flange 80 of the jar is often times nicked or broken when an attempt is made to remove the cap. This difficulty is avoided by the present invention by the construction hereinafter described.

Referring to Figs. 1, 2, 4 and 5, the opening tool of the present invention is shown therein in position for removal of the cap. When in such position, it is only necessary for the user to move the handle portion 22 upwardly in order to easily and effectively remove the cap from the jar. More specifically, and referring to Figs. 2 and 10, it will be understood that during the opening operation, the inner or adjacent edges of the lips 28 will rest upon the shoulder 82 of Fig. 4 or the flange 84 of Fig. 5 while the outer or remote corners or teeth will project under the rim of the cap. As the handle 22 is raised, a powerful camming action will be secured, see Fig. 10, and as the cap is gradually removed, both the inner and outer edges of the lips move in toward the jar. This action is important since the inward movement of the inner edges of the lips serves to secure a firmer fulcrum for the tool. At the same time, the inward movement of the outer edges compensates for the natural outward movement thereof, due to the arc of travel of the arms 24 and 26, and thus a firmer contact is maintained beneath the rim of the cap.

In order to allow the front edges of the lips to pass over the rim 80 of the jar, during removal of the cap, and also to permit the action of the inner and outer edges of the lips as stated above, the front edges of both lips 28 are curved, as shown. Moreover, a stop lug 86 is provided to limit the inward movement of the lips 28 to prevent the outer corners or teeth thereof from extending beneath the lower edge of the top flange 80. In this manner, full and complete coaction between the tool and the cap is assured, and all danger of locking the remote corners of the lips beneath the flange 80 is avoided.

Means are provided by the present invention for further reducing the manual effort required in removing the cap, and preventing nicking or marring of the under side of the cap rim. As shown, such means is constituted by beveling the outside edge of each of the lips 28 at 88, see Fig. 6, such edges forming notches between the outer corners of the lips and lugs 86. By such a construction, a flat surface engages the cap rim, and all possibility of binding of the tool and cutting of the cap rim is avoided.

Referring now to Figs. 11–13, the tool 20 illustrated therein, is provided with a pair of fixed arms 100 and 102, but the construction is such that the same desirable results are secured as in the forms previously described and which were provided with relatively adjustable arms. In the modified form, a novel lip or tooth arrangement is provided which automatically accommodates the tool for effective use with different size jars.

More particularly, and referring to Fig. 11, the arm 100 is provided with an inwardly turned lip 104 having a curved front or end edge 106, a tooth 108 being formed on one corner thereof by a curved cut-away portion or notch 110. As will appear more fully hereinafter, the tooth 108 is adapted to project beneath the rim of the cap a distance determined by the stop lug 86, and the curved part 110 bears against the rim during removal of the cap. It is pointed out here, that the curved part 110 is thus effective regardless of the size of the jar from which the cap is to be removed.

In order to adapt the modified tool to caps of different sizes, the arm 102 is provided with an inturned lip 112 which is so constituted as to provide a plurality of teeth which are automatically and selectively operable depending upon the size of the jar used. More particularly, the front or end edge 114 of the lip 112 is curved, as clearly illustrated in Fig. 11, and such edge is provided with a pair of teeth 116 and 118 which are respectively formed by curved cut-away portions or notches 120 and 122. Preferably the edge 114 is relatively straight at point 119 immediately adjacent tooth 116, for a purpose which will appear more fully hereinafter. As in the previous forms, the lip 112 is provided with the stop lug 86 in order to limit the inward travel of the edge of the lip during operation of the tool. It is desired to point out that, in operation, the tooth 116 is effective in removing caps from small size jars, while the tooth 118 comes into operation on jars of the medium and larger sizes. In order to permit the automatic selection and use of the tooth 116, the curved portion 120 is connected with the tooth 118 by a sloping edge 124 which permits the tooth 118 to clear the rim of the cap when the tool is in operation for the smaller jars.

In using the modified tool of Fig. 11, it will be understood that the same may be applied to jar caps of the conventional types illustrated in Figs. 4 and 5. If applied to small jars of the types shown in Figs. 4 and 5, it will be understood that as the tool is raised, the inner or adjacent edges of the lips 104 and 112 will rest upon the shoulder 82 of the jar of Fig. 4, or the flange 84 of Fig. 5, while the teeth 108 and 116 will project beneath the rim of the cap, the curvature of the front edges 106 and 114, and the slope of the edge 124 being such that the tooth 118 will not project beneath the cap rim. During raising of the tool, a powerful camming action will be attained, as in Fig. 10, and as the cap is removed, the teeth 108 and 116 will move in toward the jar. Thus a firmer fulcrum will be obtained for the tool and the inward movement compensates for the natural outward movement of these teeth due to the arc of travel of the arms 100 and 102, in order to obtain a firmer contact beneath the rim of the cap.

In the event that the tool is used with jars of the medium or larger sizes, it will be understood that the operation is the same as above described, except that the movement of the lips 104 and 112 beneath the cap rim is limited by the stop lugs 86, and that the cap is removed by the teeth 108 and 118 and notches 110 and 122 cooperating with the rim of the cap. The stop lugs 86 in addition to securing the advantages heretofore pointed out, also serve to prevent the teeth 108 and 116 from getting up too far between the cap and jar, which would otherwise cause a binding movement of the tool, rather than a lifting movement of the cap.

It is desired to point out that the distances between the teeth 108 and 116 on the one hand, and between teeth 108 and 118 on the other are such that the fulcrum of the tool is located at a point where a minimum of manual effort is required to remove the caps from jars of all conventional sizes. Thus very little strain is imparted to the jar and cap and breakage of the

jar or mutilation of the cap is entirely avoided, thereby enabling the cap to be re-applied to the jar after removal of a portion of the contents thereof.

It will be noted that the teeth 108, 116 and 118 are so formed as to be curved or hooked, and it has been found in practice that such a construction secures a distinct advantage. For example, the arrangement proposed permits the points of the teeth to extend upwardly beneath the rim of the cap and function as hooks during application of the tool to the cap. As a result, this construction aids in holding the arms 100 and 102 tightly against the jar parts 82 or 84 of Figs. 4 and 5, during manipulation of the tool.

A further feature includes the shape of the tooth 116 at point 119, which is so arranged that such point of the edge 114 acts as a stop, on certain size jars, to prevent the teeth 116 and 118 from projecting too far under the cap. It will be readily understood that should the teeth 116 or 118 project too far beneath the cap, the teeth would bind upon the bead 80 of the jar, and removal of the cap would be impossible.

If desired, the tool of Fig. 11, as well as the tools of the other modifications, may be provided with a bottle cap remover 130 as well as an opening 132 so that the tool may be hung on a nail or hook.

The present invention thus provides a novel and simple prying tool construction which is especially adaptable for use in connection with jar caps of the conventional pressed-on type. All forms of the invention may be used with jars of various sizes and with the variable arm types are relatively simple in construction and capable of ready adjustment, the same results are obtained by the fixed arm type wherein a variation in tooth spacing and formation is used to adapt the tool to the different size jars. In all forms, the curvature of the front edges of the lips and the use of the stop lugs enables the tool to be used without danger of chipping the glass jar as well as securing a firm fulcrum or base for the inner or adjacent edges of the lips. It will be understood that the use of arms of substantial width, considerably reduces the travel of the handle of the tool when removing caps, thus obtaining a powerful camming action, with a slight movement and a minimum of effort.

While several embodiments of the invention have been illustrated and described herein, with considerable particularity, it will be readily understood by those skilled in the art that various modifications may be made therein, without departing from the spirit of the invention. For example, while the guide slots for the variable arm have been illustrated in Figs. 1, 2 and 3, as being of a certain shape, it will be understood that other shapes may be employed to yield substantially the angular relationship as disclosed in Fig. 9. It will also be understood that the enlarged openings 40, 42 and 44 in the slot 38 may be omitted if desired, and the variable arm adjusted to any desired position in the slot. Various other changes, rearrangements and modifications may be resorted to, all within the scope of the invention. Reference will therefore be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. A tool for removing jar caps comprising a one-piece handle having a pair of spaced arms projecting therefrom and formed integrally therewith, each of the said arms being provided with a projecting lip to fit beneath the flange of a jar cap, each lip being provided with a tooth at the outside or remote corners, and at least one of the lips being provided with a second tooth adjacent the first tooth, and a stop lug formed on each of the lips adjacent the outside corners thereof and projecting upwardly from the lips to engage the flange of the cap to limit the movement of the lips beneath the flange.

2. A tool for removing flat-topped pressed-on caps from jars of the type having a bead over which a flange of the cap fits and also having a shoulder positioned below the bead, comprising a member having a handle portion and a pair of spaced-apart prying lips projecting therefrom, each of said lips having an end edge for insertion between the lower edge of the flange of the cap and the shoulder of the jar, each of said lips also having a side edge engaging said shoulder to act as a fulcrum and having also an opposite side edge engaging the flange of the cap when the handle portion is moved to raise the end edges of the lips to remove the cap, and means carried by each of said lips for engaging the flange of the jar cap to limit the movement of the lips beneath the flange to prevent the corners of the lips at the juncture of the end edges and the last named side edges from locking beneath or nicking the top bead of the jar during removal of the cap, said means comprising a part carried by the last named side edges of each of the lips and projecting upwardly therefrom when the lips are positioned beneath the cap flange.

3. A tool for removing jar caps from jars of the type having a beaded rim at the top of the jar, an annular shoulder spaced below said rim, and wherein the cap is vacuum sealed and is provided with an annular skirt having its lower edge spaced above said shoulder, comprising a handle member having a projecting lip for insertion between the shoulder and the lower edge of the cap skirt of a jar to occupy an initial position, said lip having an edge curved to substantially fit the curvature of the neck of the jar, and opposite side edges, one of said side edges resting on the jar shoulder and forming a fulcrum for the lip when the handle member is moved from the initial position to pivot the lip about said fulcrum to bring the other side edge into engagement with the lower edge of the cap skirt to remove the cap, and said lip having an abutment positioned adjacent said edge and extending above the plane of the lip to engage the outer periphery of the lower edge of the cap skirt and positively limit the distance said other side edge of the lip may project between said shoulder and the lower edge of the cap skirt to prevent the lip from interlocking with the beaded rim at the top of the jar as the lip is pivoted about said fulcrum to remove the cap.

4. A tool for removing different size caps of the pressed-on type from jars and other containers, comprising an elongated handle having a pair of spaced-apart lips projecting therefrom and positioned on opposite sides of the longitudinal axis of the handle, each of the lips being provided with an end edge and opposite side edges, the respective side edges located closest to said longitudinal axis constituting adjacent side edges and forming cam parts to co-act with a shoulder of the jar when the end edges of the lips are projected beneath the rim of the cap, and the other side edges constituting remote side edges, the end edge of one lip being provided with at least one tooth and the end edge of the other

lip being provided with a plurality of spaced-apart teeth, said tooth cooperating with one of said teeth to remove a cap of one size and said tooth cooperating with another one of said teeth to remove a cap of a different size as the handle is moved to cam the end edges of the lips upwardly with respect to said shoulder, and said lips being provided with a stop means projecting upwardly from the lips and positioned adjacent the end edges thereof for engagement with the rim of the cap to limit the movement of said end edges beneath said rim.

5. A tool as set forth in claim 4 wherein said tooth of said one lip is positioned at the juncture of the end and remote side edges thereof, and said teeth of said other lip are positioned, one at the juncture of the end and remote side edges of said other lip, and another, between said last named juncture and the juncture of the end and adjacent side edges of said other lip.

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REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
673,153	Baseler	Apr. 30, 1901
864,378	Ives	Aug. 27, 1907
1,110,908	Dickerman	Sept. 15, 1914
1,260,769	Hardy	Mar. 26, 1918
1,394,388	Wisenberg	Oct. 18, 1921
1,471,353	Pihl	Oct. 23, 1923
1,476,707	Gallagher	Dec. 11, 1923
1,490,149	Vaughan	Apr. 15, 1924
1,511,128	Hosking	Oct. 3, 1924
1,530,313	Fischer	Mar. 17, 1925
1,568,312	Becker	Jan. 5, 1926
1,661,333	Gurnett	Mar. 6, 1928
1,826,740	Courtney	Oct. 13, 1931
1,942,918	Disch	Jan. 9, 1934
2,031,420	Lebherz	Feb. 18, 1936

FOREIGN PATENTS

Number	Country	Date
116,925	Switzerland	Dec. 7, 1925
125,702	Switzerland	May 1, 1928