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DEVICE FOR FLATTENING CANS

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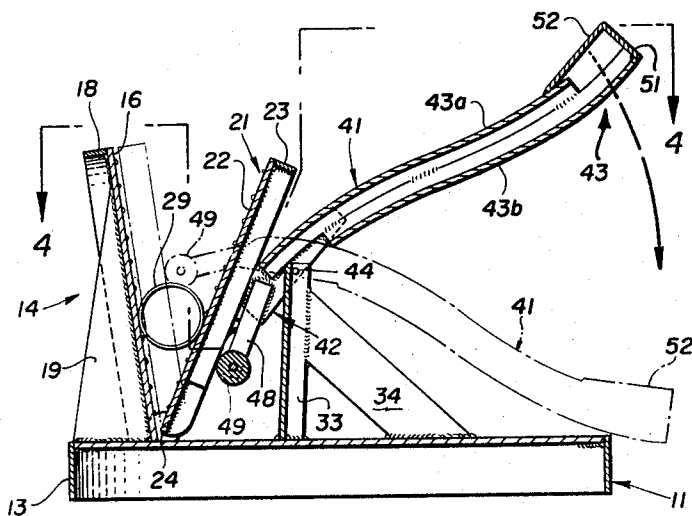
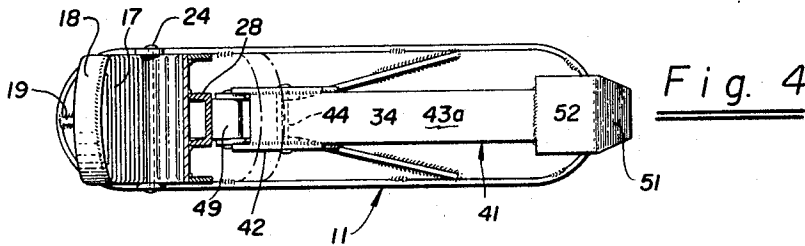


Fig. 3

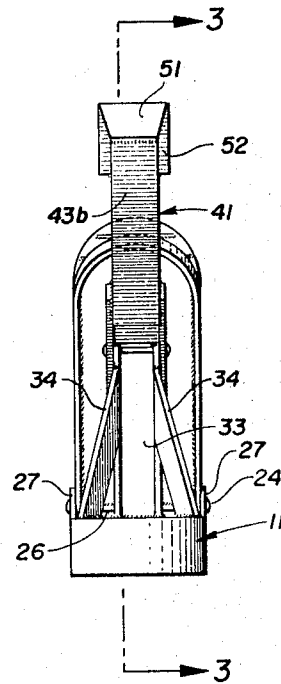


Fig. 2

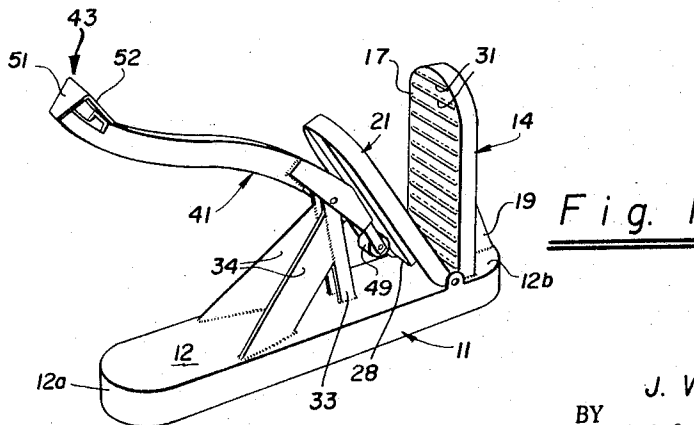


Fig. 1

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DEVICE FOR FLATTENING CANS
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This invention relates to a device for flattening cans and more particularly to such a device as used for flattening used cans.

There is a great need for such a device so that used cans, which otherwise become bulky refuse, can be flattened for convenient transportation or can be buried. At the present time, the littering of public places with tin cans is very unsightly, especially those places frequented by travelers, such as campgrounds, rest stops and the like. By flattening these cans, objections to taking them home, to a public trash can, to a dump, or burying them are overcome. In connection with burying, animals can too easily dig up cans that are not flattened.

In general, it is therefore an object of the present invention to provide a device for flattening cans which will satisfy the above needs.

Another object of the invention is to provide a device of the above character which will flatten cans without the necessity of preparing the can in any way, such as by removing its ends.

Another object of the invention is to provide a device of the above character which is mechanically operated and which has sufficient mechanical advantage so that the operator may easily crush and flatten the can.

Another object of the invention is to provide a device of the above character in which there is great mechanical advantage, especially at the end of the can flattening stroke.

Another object of the invention is to provide a device of the above character which can be operated either by the foot or hand of the operator.

Another object of the invention is to provide a device of the above character which can be either affixed in a desired location or suitably moved about from one place to another.

Additional objects and features of the invention will appear from the following description in which the preferred embodiment is set forth in detail in conjunction with the accompanying drawings of which:

FIGURE 1 is a perspective view of a device for flattening cans constructed in accordance with the present invention.

FIGURE 2 is an end elevation view of the device shown in FIGURE 1.

FIGURE 3 is a cross-sectioned view taken along the lines 3—3 of FIGURE 2 and showing in broken lines the position of one portion of the device when the device is in closed can flattening position.

FIGURE 4 is a top elevation view, partly in cross-section, of the device shown in FIGURE 3 taken along the lines 4—4.

In general, my device for flattening cans comprises a base including a fixed jaw and a movable jaw. The jaws have opposed surfaces for flattening a can as they are closed and are provided with gripping means for preventing the can from slipping out of the jaws. The jaws are closed by a special mechanism which provides increasing leverage in the final portion of the operating stroke.

More particularly, referring to the drawings, the device for flattening cans consists of a base 11 which is constructed of an elongate flat plate 12 having rounded ends 12a and 12b. The base also includes a depending skirt 13 which is welded to the outer side margins of the plate 12. The skirt 13 serves to reinforce the plate 12. The

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lower extremity of the skirt 13 lies in a plane so that the base can rest upon a flat surface. The base 11 also includes a fixed jaw member which in the embodiment shown in the drawings is an upstanding fixed jaw member 14 inclined slightly from the vertical. The jaw member 14 includes a flat can-contacting back plate 16 which is reinforced by a skirt 18 welded to the peripheral margins thereof and to the plate 12 near the end 12b. A gusset 19 is welded to the back plate 16 at the central portion thereof and to the plate 12 to provide maximum support for the back plate 16. Thus, it can be seen that the jaw member 14, gusset 19 and the base plate 12 are fastened together into a rigid assembly.

Means forming a movable jaw 21 is mounted adjacent the fixed jaw 14 for movement between open and substantially closed positions relative thereto. The movable jaw is constructed in a manner similar to that of the fixed jaw and includes a flat can contacting plate 22 reinforced by a skirt 23 welded to the peripheral margins thereof. The movable jaw 21 is secured to the base 11 for pivotal movement towards and away from the fixed jaw 14 in such a manner that the can contacting flat surfaces of the fixed and movable jaws generally face each other, and in an open position form an upwardly facing V-shaped opening for receiving a can for flattening, and in a closed position are substantially abutting. As shown in the drawings, the movable jaw 21 is pivotally mounted upon the base 12 by pins 24 passing through the lower extremities of the skirt 13 of the movable jaw 21 and ears 27 secured to the base plate 12 adjacent the fixed jaw 14.

The movable jaw 21 is reinforced by a U-shaped channel member 28 welded centrally thereto and generally normal to the axis of mounting thereof. The channel member 28 also serves the function of a follower of camming means for closing the jaw as hereinafter described.

The surfaces of the flat plates 17 and 22 of the fixed and movable jaws opposing each other are provided with can gripping means for preventing slippage of a can 29 out of the jaws as they are closed. Such means takes the form of a plurality of spaced parallel tooth-like ridges 31 formed on the surfaces of the plates parallel to the pivot axis of the movable jaw 21. The ridges may be formed by any suitable means such as by laying down weld beads on the plates. Alternatively, the surfaces may be provided with other suitable can gripping means, such as teeth, serrations, or other friction means.

Actuating means is provided for moving the movable jaw into the closed position and consists of a lever assembly mounted intermediate the base 11 and having a portion adapted to engage the movable jaw to bring said jaw into closed position with respect to said fixed jaw. Thus, there is provided an upstanding post 33 secured to the base 12 and reinforced by a pair of rearwardly and sidewardly extending spaced gussets 34 secured to the post 33 and to the plate 12.

A lever 41 has inner and outer arms 42 and 43 and is mounted for pivotal movement on the top of the post 33 which serves as a fulcrum for the lever 41. The means for mounting the lever 41 on the post 33 consists of a pin 44 extending through the lever 41 intermediate the ends thereof and through the upper end of the post 33.

The inner arm 42 of the lever is sufficiently long over-all to engage the movable jaw 21 in camming relationship so that as the outer arm 43 is moved downwardly the inner arm 42 moves upwardly in an arc which approaches the fixed plate. The inner arm 42 is provided at its end with extension brackets 48 on which is rotatably mounted a roller 49 for contacting the channel member 28 of the movable jaw 21 and for facilitating movement therealong. As the lever 41 is operated, the roller 48 rolls longitudinally up the channel member 28 of the movable jaw pushing it toward the fixed jaw 14 to thereby close the jaws.

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The outer arm 43 of the lever is constructed of a pair of curved steel tubular members 43a and 43b welded together side by side to form a unitary structure which resists bending. Affixed to the end 51 of the outer arm 43 is a toe plate 52 welded to the end of the arm 43 and which has a flat plate upper portion to be engaged by a hand or foot for downward operating movement of the lever. The outer operating arm 43 is made longer than the inner arm 42 to provide mechanical leverage. The end 12a of the base extends outwardly from the jaws and underneath the arm 43 to support the device against tipping.

The operation of my device can be best seen with reference to FIGURE 3 and is as follows. The outer arm 43 of the lever is in the upward position and the movable jaw 21 is open so that the jaws are in the can receiving configuration. A can is placed in the jaws, either with its axis in the same direction as the pivot axis of the movable jaw, as shown, or in any other position. The outer arm 43 of the lever is brought downwardly to the position shown in broken lines as by a foot pressing on the toe plate. As the inner arm 42 moves upwardly in response to the downward movement of the outer arm 43, the roller 48 cams the movable jaw 21 into closed position, shown in broken lines, to thereby flatten the can.

The relationship and sizes of the various members of my device provide great usable mechanical advantage in its operation. The lever 41 is constructed so that the outer arm 43 is longer than the inner arm 42 to thereby provide mechanical advantage about the fulcrum point. Typically, the distance between the operating end and the fulcrum is made about three times longer than the distance between the fulcrum and camming end. As the jaws are closed, the over-all mechanical leverage increases even more for another reason. In this construction, the leverage is also a function of the ratio of the relative angular velocities of the lever and of the movable jaw. As shown, when the movable jaw 21 approaches closed position, the inner arm of lever 41 is long enough to just reach the jaw 21 and therefore moves the movable jaw angularly a very slight amount at this portion of the stroke. This varying leverage combines with the leverage from the ratio of the lengths of the lever about the fulcrum point to produce a highly compounded leverage at the final portion of the can flattening stroke.

It is apparent from the foregoing that I have provided a unique can flattening device which is simple in construction and very positive in operation. Such a device can easily be set in concrete for permanent location at a camp-site area or can be fastened onto other materials by screws or bolts through the holes in the base. Alternatively, it can be carried as a portable implement with other camp gear in an automobile or other vehicle from one location to another.

I claim:

1. A device for flattening cans and the like comprising an elongate base adapted to rest upon a horizontal supporting surface, a fixed jaw mounted in upstanding relation at one end of the base, a movable jaw, pivot means carried on the base for mounting said movable jaw for movement between open and closed positions with respect to said fixed jaw, said pivot means being positioned immediately adjacent said fixed jaw so that as the surfaces of the fixed and movable jaws generally face each other and substantially abut along their entire surfaces when the jaws are closed, the jaws forming an upwardly V-shaped opening for receiving a can when the jaws are opened, the surfaces of the jaws having a plurality of spaced parallel tooth-like ridges formed thereon and parallel to the axis defined by the pivot means, said ridges serving as a can gripping means for preventing slippage of the can out of the jaws as they are closed, a generally vertical fulcrum post secured to an intermediate portion of the base, a rigid lever, means pivotally mounting said lever on said fulcrum post for movement in a plane intersecting the axis of said

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first named pivot means at substantially right angles thereto, said lever having an inner end extending towards said movable jaw, and an outer end extending away from the movable jaw and adapted to be engaged by a hand or foot for downward operating movement, and a single roller rotatably mounted on said inner end of the lever and engaging the movable jaw whereby as the outer end of the lever is moved downwardly, the inner end of the lever with the roller thereon moves upwardly in an arc which approaches the fixed jaw and rolls along the movable jaw to push the movable jaw toward the fixed jaw.

2. A device for flattening cans and the like comprising an elongate base adapted to rest upon a horizontal supporting surface, a fixed jaw mounted in upstanding relation at one end of the base, a movable jaw, pivot means carried on the base for mounting said movable jaw for movement between open and closed positions with respect to said fixed jaw so that as the surfaces of the fixed and movable jaws generally face each other and substantially abut along their entire surfaces when the jaws are closed, the jaws forming an upwardly V-shaped opening for receiving a can when the jaws are opened, the surfaces of the jaws having a plurality of spaced parallel tooth-like ridges formed thereon and parallel to the axis defined by the pivot means, said ridges serving as a can gripping means for preventing slippage of the can out of the jaws as they are closed, a generally vertical fulcrum post secured to an intermediate portion of the base, a rigid lever, means pivotally mounting said lever on said fulcrum post for movement in a plane intersecting the axis of said first named pivot means at substantially right angles thereto, said lever having an inner end extending towards said movable jaw, and an outer end extending away from the movable jaw and adapted to be engaged by a hand or foot for downward operating movement and a roller rotatably mounted on said inner end of the lever and engaging the movable jaw whereby as the outer end of the lever is moved downwardly, the inner end of the lever with the roller thereon moves upwardly in an arc which approaches the fixed jaw and rolls along the movable jaw to push the movable jaw toward the fixed jaw, said movable jaw further including a vertically arranged U-shaped channel member fastened to the mid-region of the movable jaw and presenting an outwardly facing bearing surface, the roller being adapted to engage said outwardly facing surface of the channel member as the inner end of the lever moves upwardly, the channel member also serving to support the movable jaw as a rigid unit and to distribute the forces applied by the roller over the movable jaw.

3. A device for flattening cans and the like comprising an elongate base adapted to rest upon a horizontal supporting surface, a fixed jaw mounted in upstanding relation at one end of the base, a movable jaw, pivot means carried on the base for mounting said movable jaw for movement between open and closed positions with respect to said fixed jaw so that as the surfaces of the fixed and movable jaws generally face each other and substantially abut along their entire surfaces when the jaws are closed, the jaws forming an upwardly V-shaped opening for receiving a can when the jaws are opened, the surfaces of the jaws having a plurality of spaced parallel tooth-like ridges formed thereon and parallel to the axis defined by the pivot means, said ridges serving as a can gripping means for preventing slippage of the can out of the jaws as they are closed, a generally vertical fulcrum post secured to an intermediate portion of the base, a rigid lever, means pivotally mounting said lever on said fulcrum post for movement in a plane intersecting the axis of said first named pivot means at substantially right angles thereto, said lever having an inner end extending towards said movable jaw, and an outer end extending away from the movable jaw and adapted to be engaged by a hand or foot for downward operating movement and a roller rotatably mounted on said inner end of the lever and engaging the

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movable jaw whereby as the outer end of the lever is moved downwardly, the inner end of the lever with the roller thereon moves upwardly in an arc which approaches the fixed jaw and rolls along the movable jaw to push the movable jaw toward the fixed jaw, said movable jaw further including a vertically arranged U-shaped channel member fastened to the mid-region of the movable jaw and presenting an outwardly facing bearing surface, the roller being adapted to engage said outwardly facing surface of the channel member as the inner end of the lever moves upwardly, the channel member also serving to support the movable jaw as a rigid unit and to distribute the forces applied by the roller over the movable jaw, said lever being proportioned such that the outer end of the lever is approximately three times further away from the fulcrum point than the inner end of the lever.

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