April 21, 1925. 1,534,484

W. H. AVERILL

CAN OPENER

Filed May 18, 1921

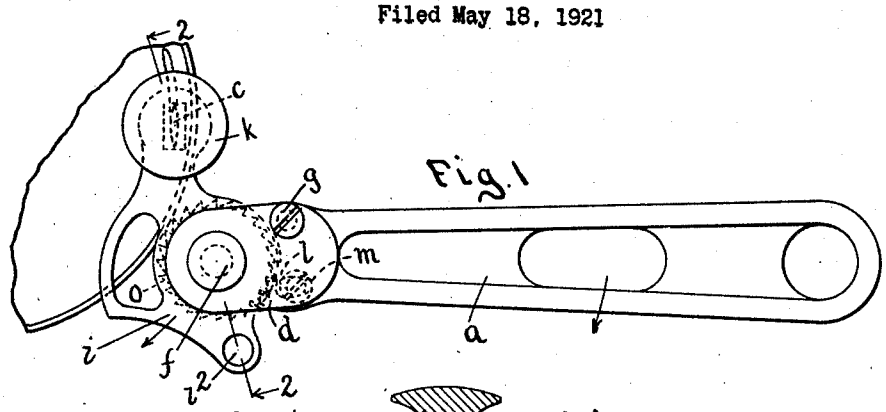


Fig. 1

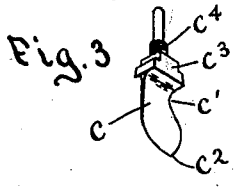


Fig. 3

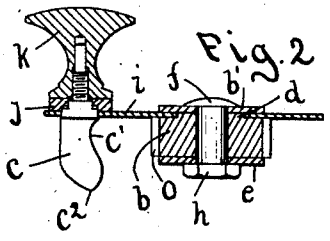


Fig. 2

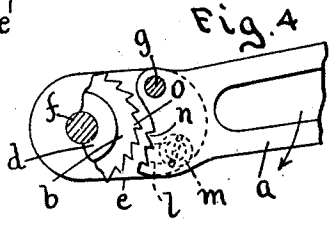


Fig. 4

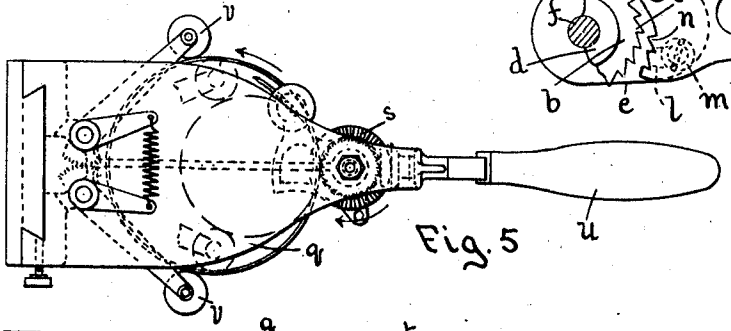


Fig. 5

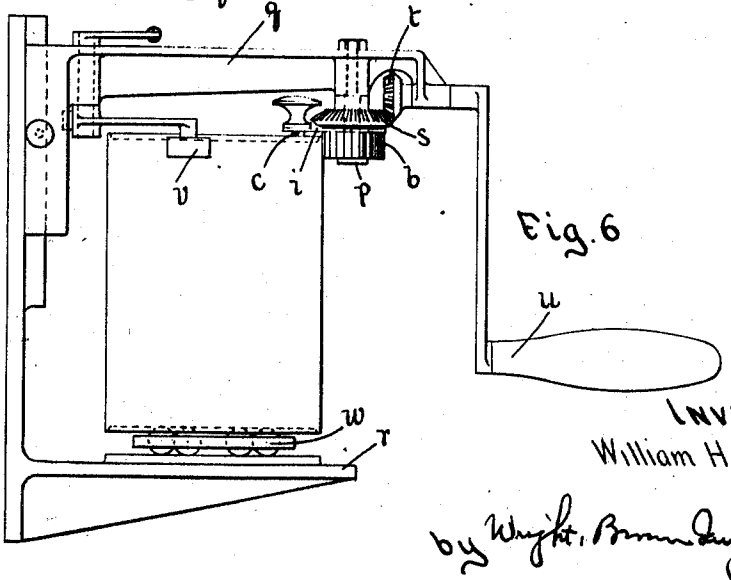


Fig. 6

INVENTOR

William H Averill

by Wright, Brown, Quinby & Macy

Attys

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UNITED STATES PATENT OFFICE.

WILLIAM H. AVERILL, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO ARTHUR C. ERISMAN, OF BROOKLINE, MASSACHUSETTS.

CAN OPENER.

Application filed May 18, 1921. Serial No. 470,529.

To all whom it may concern:

Be it known that I, WILLIAM H. AVERILL, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Can Openers, of which the following is a specification.

The present invention relates to implements or machines adapted to open tin cans by cutting out the head or end wall of such can from the side walls thereof on a line more or less near the periphery of such end wall.

The main object which I have had in view in developing this invention is to perform the action of cutting such cans with a smooth, clean cut and without forming upturned jagged edges which are liable to tear and cut the hands of the user. I have embodied the invention both in a hand tool and in a machine, and have shown for illustration in the present application one form of the hand tool and one form of the machine. In all forms of the invention, however, there are found the essential features of a toothed wheel which travels along the side of the can adjacent to the end wall and a cutter which penetrates the end wall and trails the wheel; said wheel, when rotated, compelling a relative travel to take place between the can and the cutter.

The hand tool is provided with a handle which constitutes a means for rotating the toothed wheel, whereby the wheel is caused to travel around the can, dragging the cutter with it; while in the machine a different form of mechanism drives the toothed wheel and the latter causes the can to be rotated while the cutter stands still.

One form of each of the above mentioned embodiments of the invention is shown in the drawings furnished with this specification, and in said drawings,

Figure 1 is a plan view of the hand tool embodiment in action for cutting out the head of a can.

Figure 2 is a cross section of the tool on line 2—2 of Figure 1.

Figure 3 is a perspective view of the cutting tool detached.

Figure 4 is a fragmentary plan view with parts of the handle and feed wheel cut away.

Figure 5 is a plan view of a machine embodying the invention.

Figure 6 is an elevation of the machine.

Describing first the hand tool or implement embodiment of the invention, the same consists of a handle *a*, a feed or driving wheel *b* and a cutter *c*. The handle is coupled to the wheel by link plates *d* and *e*, a pivot *f* and a pivot *g*. Said plates overlie and embrace the wheel and the adjacent end of the handle, and the pivot *f* passes through the plates and the wheel, having a head on one end and a nut *h* on the other end which respectively overlie and confine the plates. The pivot *g* passes through the handle and the plates.

Connecting the cutter to the parts previously described is a plate *i* confined between the wheel and the link plate *d*, and having an opening which fits over a hub part *b'* on the wheel. This plate is adapted to swing, turning upon said hub. The cutter itself is a knife blade having a cutting edge *c'* and an end edge or point c^2, the formation of the latter enabling the knife to be forced through the wall of the can to be cut and the edge *c'* dividing the metal of the wall when relative motion takes place between the can and the tool. The shank of the cutter has a non-circular part c^3 and a threaded extension c^4, of which the non-circular part enters a correspondingly shaped socket in the plate *i* and in a pad *j* mounted upon it, while the extension passes through said pad and is received in a tapped hole in a nut *k*. The nut extends over the end of the shank and is widened at its end so as to provide a broad, smooth surface upon which pressure may be exerted by the user's finger or a part of his hand to force the knife through the can.

A limited amount of oscillative movement is permitted between the handle *a* and the feed wheel *b* about the pivot pin *g* as an axis, the limits of such movement being established by a slot *l* in the link *e* through which a screw *m* passes and is seated in the handle. On the end of the handle opposite the pivot *g* are provided a number of teeth *n* and intermediate notches, complemental to teeth *o* and intermediate notches on the periphery of the wheel *b;* said teeth *o* being provided for the double purpose of interlocking the teeth *n* and forming abutments against which the latter may press, and of biting into the side of the can.

In using the embodiment of the invention just described for cutting open a can, the knife is first caused to penetrate the head of the can near an edge thereof, being so placed that the side of the blade is approximately parallel to the circumference of the can and the wheel being placed at the same time beside the lateral wall of the can. Then the handle *a* is swung back and forth, alternately in the direction of the arrow shown in Figure 1 and in the opposite direction. The first effect of the movement denoted by the arrow is to bring the pawl teeth *n* of the handle into mesh with the teeth *o* of the wheel, and the next effect is to press the teeth of the wheel against the side of the can and to turn the wheel about the axial pivot *f*. Rotation of the wheel while its teeth bite into the can necessarily causes the wheel to roll about the periphery of the can and to draw the cutter after it. Reverse movement of the handle swings the teeth *n* first away from the wheel and then back around its periphery into position to reengage the teeth *o* at another point. Thus the handle acts upon the wheel in the manner of a feed pawl upon a ratchet and rotates it intermittently. Such rotation causes an intermittent rolling progress of the wheel about the can and a similar progress of the cutter in a path which tends to approach the side of the can, but is deflected by the side walls and the changing direction of the travel of the wheel.

The plate *i* is so formed that it overlies the head of the can in front of the wheel as well as in rear of it and supports that part of the tool, preventing the weight of the tool from drawing the knife out of the cut by the leverage of the plate *i* on the edge of the can as a fulcrum. The configuration of the cutting edge *c'* also assists in retaining the knife in the cut, as it is recessed or concaved toward that part which intersects the plane of the can head.

As the force exerted upon the knife is substantially in the plane of the can head and neither outward nor inward, the cut made by the knife is even and smooth, free from the upturned jagged edges which are made by the usual type of can opening implement. Neither does the action of the cutter tend to force the head into the interior of the can and displace the contents. The operator may thus hold the can steady on a table or bench with one hand while manipulating the implement with the other, all without liability of cutting the hand which holds the can or of spilling the contents.

While the relative motion between the can and the cutter of the implement above described is that of a travel of the cutter around the can, Figures 5 and 6 show a machine wherein such movement is of the reverse character. The wheel *b* plate *i* and the cutter *c* are substantially the same in this machine as in the hand implement, but are supported by a shaft *p* which depends from a bracket *q* overhanging a shelf *r* whereon the can to be opened is placed. The shaft *p* is made fast to the wheel *b* and also to a bevel gear *s*. A complemental bevel gear *t* is supported by the bracket *q* and is connected with a crank *u*. Guide rolls *v* are arranged to engage the can at two or more points at the opposite side of a diameter from the point at which the feed wheel *b* engages it and are adjustable to accommodate cans of different sizes, as shown in Figure 5; while anti-friction balls or equivalent rolls *w* on the shelf *r* support the weight of the can in a manner permitting it to be easily turned. The shelf and bracket are adapted to be mounted upon a wall or upon a post or any other upright support, and one of them is adjustable up and down with respect to the other so as to hold cans of different heights in proper position to engage the feed wheel and cutter.

With the supporting and guiding means for the can adjusted appropriately to the can being opened, as shown in Figure 6, the side of the can is held forcibly against the feed wheel and the cutter extends through the head; and then rotation of the crank *u* drives the feed wheel *b* and causes the can to be rotated about its own axis, moving the head relatively to the cutter and thereby causing the central part of the head to be severed from its peripheral part or from the side walls of the can.

Having thus described two of the principal embodiments of the invention, I desire to point out that many variations of or modifications in the structural forms and adjuncts of each embodiment may be made without departure from the essentials of the invention which are here claimed. Among the features here illustrated, which are claimed subordinately as useful parts of the invention but which are not fundamental essentials thereof, are the provision for relative movement between the handle and feed wheel of the implement form and the disengageable interlocking connection between the handle and wheel. Indeed, the implement form of can opener, as well as the machine embodiment, may be made with the handle and wheel in rigid continuous connection and I have made an implement in which such rigid connection exists; the equivalent of the links *d* and *e* being then integral with or fast to the handle and one of the links being secured non-rotatably to the feed wheel.

What I claim and desire to secure by Letters Patent is:

A can opener comprising a propelling wheel having a serrated edge, a plate piv-

otally connected to said wheel, a knife projecting from said plate at the same side thereof as the wheel and having a cutting edge directed toward the wheel, a handle, and a link connecting the handle to the wheel and having a pivotal connection with both of the last named elements, the handle having teeth complemental to the serrations of the wheel adapted to engage therewith for imparting rotary movement thereto.

In testimony whereof I have affixed my signature.

WILLIAM H. AVERILL.