

UNITED STATES PATENT OFFICE.

WILLIAM A. BOYD, OF NEW HAVEN, AND ROBERT H. BURNS, OF WEST HAVEN,
CONNECTICUT.

CAN-OPENER.

1,370,943.

Specification of Letters Patent.

Patented Mar. 8, 1921.

Application filed October 13, 1919. Serial No. 330,280.

To all whom it may concern:

Be it known that we, (1) WILLIAM A. BOYD, (2) ROBERT H. BURNS, citizens of the United States, residing at (1) New Haven, State of Connecticut, have invented an Improvement in Can-Openers, of which the following is a specification.

This invention has for its object to provide a can opener which may be attached to a table or other fixture and is adapted either for family use or for use in hotels, restaurants, paint shops or wherever large numbers of cans are to be opened, which will grip and hold cans of different sizes by means of two simple movements and will remove the entire top of the can by means of two other movements without in any way disturbing the contents of the can.

With these objects in view we have devised the novel can opener which will now be described in connection with the accompanying drawing forming a part of this specification, reference characters being used to indicate the several parts.

Figure 1 is a side elevation showing our novel can opener as in use, a can being indicated by dotted lines;

Fig. 2 a plan view of the upper operating plate, the sliding shaft being in section on the line 2—2 in Fig. 1, looking down;

Fig. 3 an inverted plan view corresponding with Fig. 2, showing the cutter plate and parts carried thereby;

Fig. 4 a plan view of the jaw plate and jaws;

Fig. 5 an inverted plan view corresponding with Fig. 4, the split hub and shaft being in section on the line 5—5 in Fig. 1, looking up;

Fig. 6 a detail sectional view, on an enlarged scale, on the line 6—6 in Fig. 3, looking in the direction of the arrows, and

Fig. 7 is a similar view, illustrating the use of a piercing spur in cooperation with the rotary cutter.

The frame of our novel can opener comprises a standard 10 having an arm 11, and a clamp 12 by which the structure as a whole may be rigidly secured to a table or other fixture. The can to be operated upon, indicated by dotted lines in Figs. 1, 3 and 4, is placed centrally upon a jaw plate 13 which lies upon the lower operating plate 14. The

jaw plate is rigidly secured to a shaft 15 which is frictionally clamped in a split hub 57 on the frame by means of a cross bolt 58. The operating plate rests on the hub and may oscillate on the shaft, and the two plates, when locked together as will presently be explained, with the shaft, may be oscillated together on the frame. 16 denotes holding jaws for the can, each of which is pivoted on a stud 17. These studs pass through arcuate slots 18 in operating plate 14 and arcuate slots 19 in the jaw plate. The slots cross each other and the studs lie at the intersections of the slots. Slots 18 in the operating plate are made relatively wide and the studs pass through rollers lying in these slots, which renders it practically impossible for the studs to bind. The rollers in slots 18 do not appear in the drawing, but the construction is identical with that illustrated in Fig. 6, in connection with the cutter plate. The jaws are retained in operative position by means of guide pins 29 which extend from the jaws and engage slots 19 in the jaw plate. The heads of the studs, indicated by 21, lie under the operating plate and the parts are retained in place by nuts 22, which turn down against shoulders on the studs to prevent binding. The jaw plate is provided with a peripheral ratchet 23 which is engaged and locked against backward movement by a spring controlled pawl 24 pivoted on lower operating handle 27, which is rigidly secured to the lower operating plate and extends outward radially therefrom.

The operation of gripping and releasing cans of varying sizes will be readily understood from Figs. 4 and 5. When the ratchet is engaged by the pawl the jaw plate and the operating plate will be locked together and may be rotated as one in a counter-clockwise direction by means of the handle. When the pawl is disengaged from the ratchet, movement of the operating plate, by means of the handle, in either direction, will have a tendency to cause the jaw plate to move in the opposite direction. When the handle is swung downward from the position shown in Fig. 4, *i. e.* clockwise, the operating plate will have rotary clockwise movement and the jaw plate will tend to move in a counter-clockwise direction. The effect will be to cause the outer ends of-

corresponding slots 18 and 19 to move toward each other and the inner ends of said slots to move away from each other, and consequently cause the jaw carrying studs at the intersections of said slots to move outward carrying the jaws outward which would release a can. If the pawl is removed from the ratchet and the handle is moved upward from the position shown in Fig. 4, *i. e.*, counter-clockwise, the effect will be just the reverse. The outer ends of the slots will move away from each other and the inner ends toward each other which will cause the jaw carrying studs at the intersections of the slots to move inward with a spiral movement and consequently the jaws will be caused to grip a can with a wedging action and hold it securely. The jaws will adapt themselves to a round can of any size within the compass of the implement. When the lower operating handle is being swung counter clockwise and the jaws are being set to grip a can, the pawl is held out of engagement with the teeth of the ratchet, and as soon as the jaws are in the gripping position the pawl is made to engage the ratchet. In this position of the parts the plates are locked together and may be rotated in a counter-clockwise direction as one, the frictional grip of the split hub on shaft 15, while sufficient to hold the jaw plate stationary when the operating plate and jaw plate are not locked together, is easily overcome through the leverage of the operating handle when they are locked together. It is owing to the fact that the jaw plate is held stationary in the gripping movement, the operating plate only having rotary movement, that the jaws move inward with a spiral instead of a radial movement.

30 denotes the cutter plate which is rigidly secured at the lower end of a non-rotatable shaft 32 which is adapted to slide vertically in arm 11 of the frame and is held against rotation therein, said shaft being in alignment with shaft 15. 31 denotes the upper operating plate which rests upon the cutter plate and is adapted to oscillate on the shaft. Cutter plate 30 and upper operating plate 31 correspond substantially with jaw plate 13 and lower operating plate 14 but with this difference, that the jaw plate lies above the lower operating plate and the cutter plate lies below the upper operating plate, and that said operating plates are operatively rotated in opposite directions.

36 denotes stop plates, each of which is mounted on a stud 37. These studs pass through arcuate slots 38 in operating plate 31 and through arcuate slots 39 in cutter plate 30. The slots cross at their midlengths as before and the studs lie at the intersections of the slots. The slots in the operating plate are relatively wide and the studs pass

through rollers 20 lying in these slots. The stop plates are retained in operative position by means of guide pins 49 extending from the plates and engaging slots 39 in the cutter plate. The heads of the studs, indicated by 41, lie above the operating plate and the parts are retained in place by nuts 42. The cutter plate is provided with a peripheral ratchet 43 which is engaged by a spring controlled pawl 44 pivoted on upper operating handle 47 which is rigidly secured to the upper operating plate and extends outward radially therefrom.

Each stud 37 carries a rotary cutter 50, a piercing spur 51 and a can support 52. The cutters oscillate on bushings 53 which also pass through the piercing spurs. The backs of the spurs rest against flanges 54 on the stop plates which prevent the spurs from turning on the bushing. The cam supports are pivoted below the cutters on studs 37, their limit of oscillation being determined by stops 56 on plates 36, against which they are yieldingly held by springs 59 connected to pins 60 and 61 on the stop plates and can supports respectively.

In use when studs 37 are forced inward, as already explained, the tips of the can supports, indicated specifically by 55, first engage the can and the supports are oscillated on their pivots slightly away from the stops, and against the power of the springs. Any possible tilting of the can is thus effectually prevented.

The function of the piercing spurs is to pierce the can and relieve the cutters from the duty of starting the cuts. The implement is operative, however, without the piercing spurs, and in Fig. 6 we have illustrated a slightly modified form in which piercing spurs are dispensed with. When the cutters, either with or without the co-operation of piercing spurs, are forced through the can the rim of the can is engaged by the inner faces of the stop plates, which are specifically indicated by 40, see Figs. 6 and 7, these plates gripping the rim of the can firmly and limiting the inward movement of the cutters. Crushing of the can is thus rendered practically impossible, and the implement rendered fool proof.

The cutter plate is raised and lowered by means of a lever 62 to the midlength of which sliding shaft 32 is pivoted. One end of this lever is pivoted to an arm 63, itself pivoted to the top of the standard. The shaft and cutter plate are held in the raised position by means of a pawl 64 which is pivoted to the lever and engages a curved ratchet on the face of the arm. The free end of the lever is provided with a handle 65 and a spring controlled bell crank hand lever 66 from which a rod 67 extends to the pawl. By means of the hand lever the operator disengages the pawl from the ratchet

which leaves the sliding shaft and parts carried thereby free to be moved upward or downward.

The operation of placing the cutters in operative position is practically the same as that of gripping the can, the gripping operation being produced by movement of the lower operating handle and the setting of the cutters by movement of the upper operating handle, the handles being swung in opposite directions toward each other and the ratchet teeth inclining in opposite directions to correspond. In the drawing we have shown a structure in which the gripping operation is performed by a counter-clockwise movement and the setting of the cutters in operative position by clockwise movement of the upper operating handle. That is immaterial, however, as the movements of the respective operating handles may obviously be reversed if preferred.

The operation of opening a can is briefly as follows: The cutter plate is raised high enough to permit the can to be conveniently placed centrally on the jaw plate and handle 27 is operated to cause the jaws to grip the can with a slightly wedging action as already described, the pawl sliding over the ratchet and then locking the parts in the gripping position. The sliding shaft is then released and the cutter plate moved downward until it rests on the can. Handle 47 is then operated to cause the piercing spurs, if used, to pierce the can just below the top and to force the edges of the cutters into the openings made by the spurs, the pawl sliding over the ratchet and then locking the cutters in operative position. When the parts are in this position the can is held firmly and removal of the top of the can is effected by swinging the jaw plate, and with it the can, counter-clockwise by means of operating handle 27. In the drawing we have illustrated the use of three cutters, in which case but a third of a rotation of the jaw plate is required to remove the top of a can. Having opened the can the sliding shaft, carrying the cutter plate and upper holding plate, is raised by means of the lever, pawl 64 holding said parts in the raised position.

Pawl 24 is then operated to release the lower operating handle which is swung clockwise, the effect of which is to open the jaws. In this operation the lower operating plate is oscillated on shaft 15, the shaft itself and the jaw plate being frictionally held against rotation by cross bolt 58 in the split hub. The opened can is now free and may be removed.

It will be seen that we have provided a construction which fulfils the objects primarily stated, and while we have shown but a single physical embodiment of the invention it is to be understood that modifications

of the structure shown may be made by those skilled in the art without departing from the invention as defined by the following claims.

We claim—

1. A structure of the character described comprising an oscillatable jaw plate, movable jaws carried thereby, a cutter plate, movable piercing spurs and movable rotary cutters carried thereby, a vertically sliding shaft by which the cutter plate is carried, and means for locking said shaft against downward movement.

2. A structure of the character described comprising an oscillatable operating plate having arcuate slots, an oscillatable jaw plate having arcuate slots, said slots crossing each other, studs lying at the intersections of said slots, and jaws carried by said studs.

3. A structure of the character described comprising an oscillatable operating plate having arcuate slots, an oscillatable jaw plate having arcuate slots, said slots crossing each other, studs lying at the intersections of said slots, jaws carried by said studs, and means for locking the plates against independent movement in one direction and also locking the jaws in the gripping position.

4. A structure of the character described comprising an oscillatable operating plate having arcuate slots, an oscillatable jaw plate having a peripheral ratchet, and arcuate slots crossing the slots in the operating plate, studs lying at the intersections of said slots, jaws carried by the studs, and a pawl adapted to engage the ratchet and lock the jaw plate against independent movement in one direction.

5. A structure of the character described comprising an oscillatable jaw plate having arcuate slots, a shaft by which said plate is carried, a split hub and cross bolt by which the shaft is frictionally held, an operating plate having arcuate slots crossing the slots in the jaw plate, studs lying at the intersections of said slots, jaws carried by said studs, and means for locking the jaw plate against movement in one direction independently of the operating plate.

6. A structure of the character described comprising an oscillatable operating plate having arcuate slots, a superposed oscillatable jaw plate having arcuate slots crossing the slots in the operating plate, studs lying at the intersections of said slots, jaws pivoted on said studs, and pins extending from the jaws and engaging the slots in the jaw plate whereby the jaws are retained in operative position.

7. The combination with oscillatable means for holding a can, of a cutter plate having arcuate slots, an oscillatable operating plate having arcuate slots crossing the slots in the cutter plate, studs lying at the in-

tersections of said slots, rollers on said studs engaging the slots in the operating plate and rotary cutters carried by said studs, oscillation of the operating plate acting to move the studs and cutters into operative position.

8. The combination with oscillatable means for holding a can, of a cutter plate having arcuate slots, an oscillatable operating plate having arcuate slots crossing the slots in the cutter plate, studs lying at the intersections of said slots, and rotary cutters and stop plates pivoted on said studs, said stop plates engaging the can when the studs are moved inward and limiting the inward movement of the cutters.

9. The combination with oscillatable means for holding a can, of a cutter plate having arcuate slots, an oscillatable operating plate having arcuate slots crossing the slots in the cutter plate, studs lying at the intersections of said slots, rotary cutters, stop plates and spring controlled can supports carried by the studs, and stops to limit the movement of the can supports.

10. The combination with oscillatable means for holding a can, of a cutter plate having arcuate slots, an oscillatable operating plate having arcuate slots crossing the slots in the cutter plate, studs lying at the intersections of said slots, rotary cutters and stop plates carried by the studs, pins extending from the stop plates and engaging the slots in the cutter plate, and piercing spurs co-acting with the cutters.

11. The combination with oscillatable means for holding a can, of a cutter plate having arcuate slots, an oscillatable operating plate having arcuate slots crossing the slots in the cutter plate, studs lying at the intersections of said slots, rotary cutters carried by the studs, a sliding shaft by which said plates are carried and means for locking said shaft and plates in a raised position.

12. The combination with oscillatable means for holding a can, of a cutter plate having arcuate slots, an oscillatable operating plate having arcuate slots crossing the slots in the cutter plate, studs lying at the intersections of said slots, rotary cutters carried by the studs, a sliding shaft by which said plates are carried, and means for locking the operating plate against backward

movement and the cutters in operative position.

13. The combination with a frictionally held oscillatable jaw plate, an oscillatable lower operating plate, arcuate slots in said plates which cross each other, jaw carrying studs in said slots, and a pawl and ratchet connection between said plates, of a cutter plate, a non-rotating sliding shaft by which it is carried, an oscillatable upper operating plate, arcuate slots in said plates which cross each other, cutter carrying studs at the intersections of said slots, and a pawl and ratchet connection between said plates, oscillation of the lower operating plate when the cutters are set acting to remove the top of a can.

14. The combination with a frictionally held oscillatable jaw plate, jaws, a lower operating plate, and intermediate connections whereby oscillation of said plate will cause movement of the jaws, of a cutter plate, cutters carried thereby, a non-rotatable sliding shaft by which said plate is carried, an upper operating plate, and intermediate connections whereby oscillation of said plate will set or retract the cutters.

15. The combination with an oscillatable operating plate having arcuate slots, an oscillatable cutter plate having arcuate slots, said slots crossing each other, and studs passing through said slots, of rotary cutters carried by said studs.

16. The combination with an oscillatable operating plate having arcuate slots, an oscillatable cutter plate, having arcuate slots, said slots crossing each other, and studs passing through said slots, of rotary cutters and stop plates carried by said studs.

17. The combination with an oscillatable operating plate having arcuate slots, an oscillatable cutter plate having arcuate slots, said slots crossing each other, and studs passing through said slots, of rotary cutters and stop plates carried by said studs, and pins extending from the stop plates and engaging the slots in the cutter plate.

In testimony whereof we affix our signatures.

WILLIAM A. BOYD.
ROBERT H. BURNS.