C. O. NICOLAI.

CAN OPENING MACHINE.

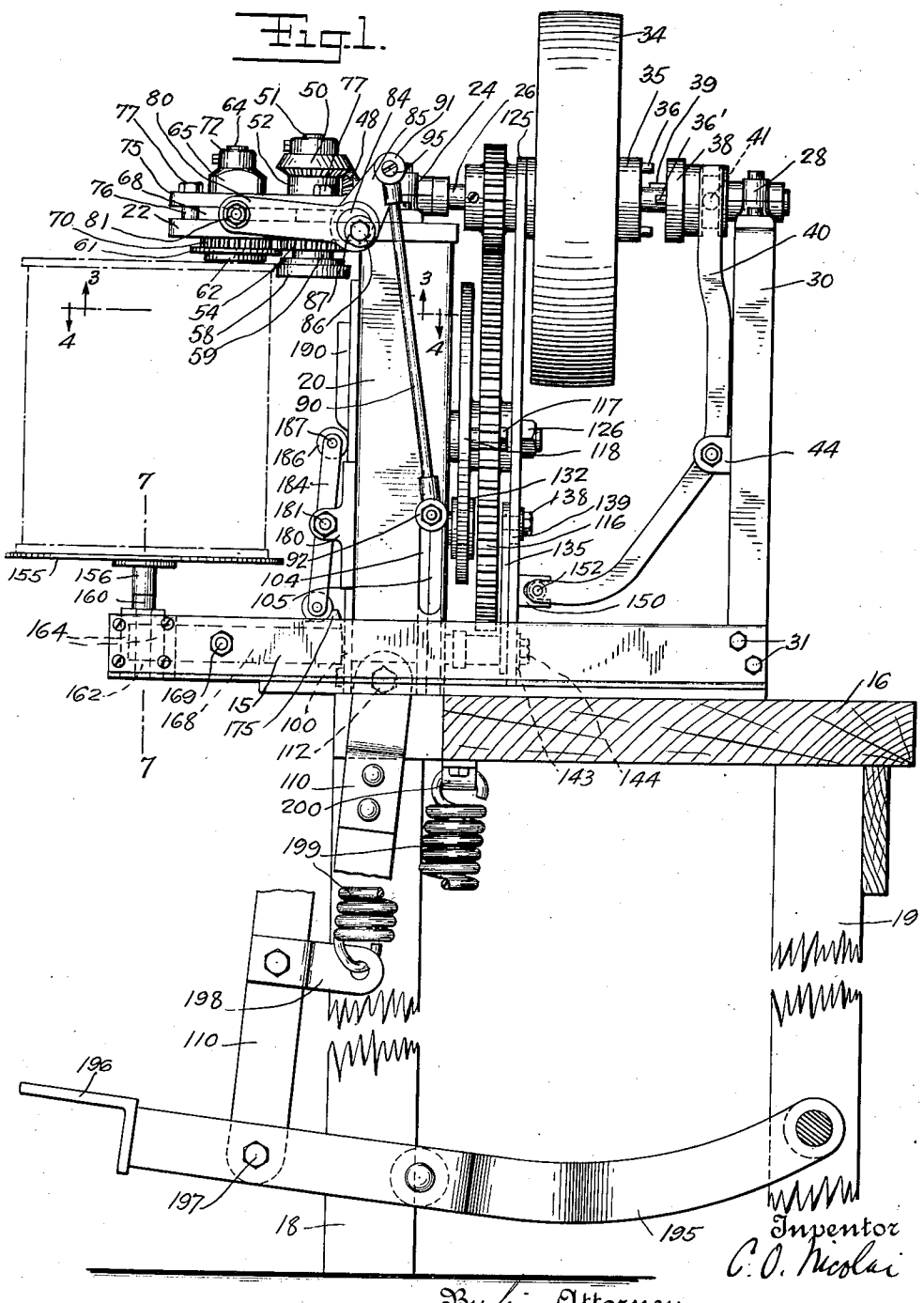
APPLICATION FILED JUNE 18, 1921.

1,405,066.

Patented Jan. 31, 1922.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 2.

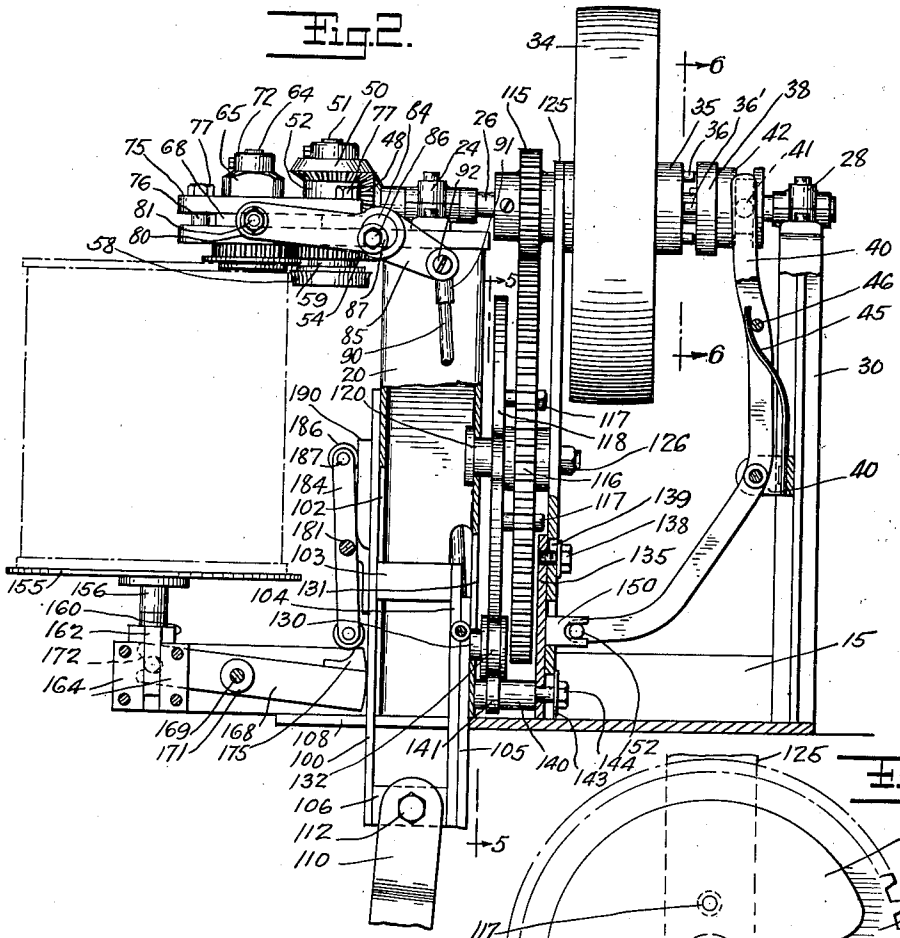


Fig. 5.

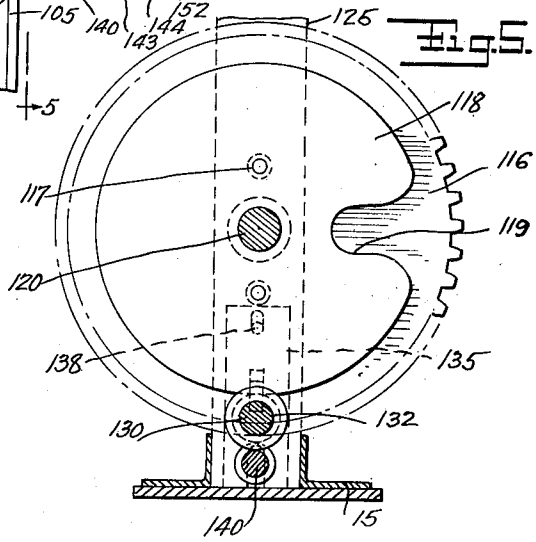
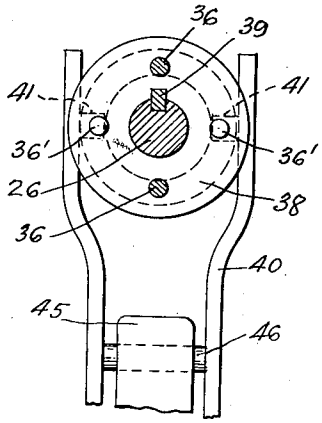


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 3.

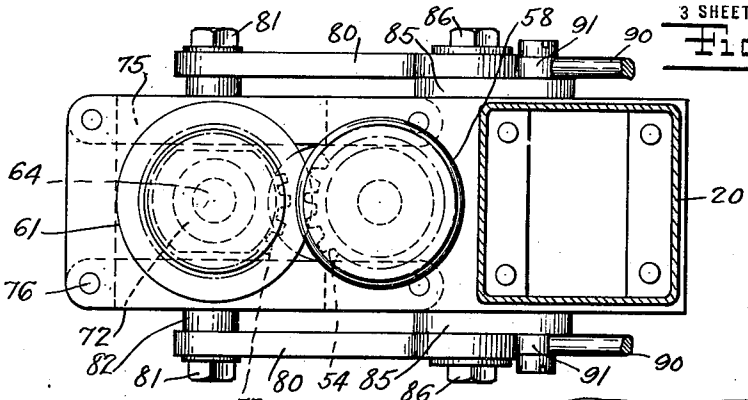


Fig. 4.

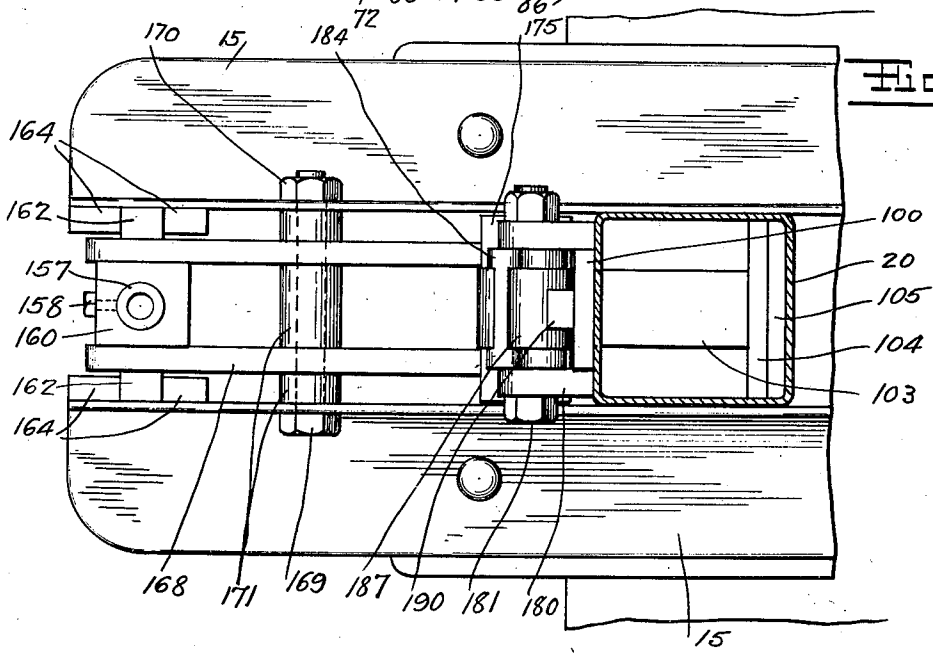
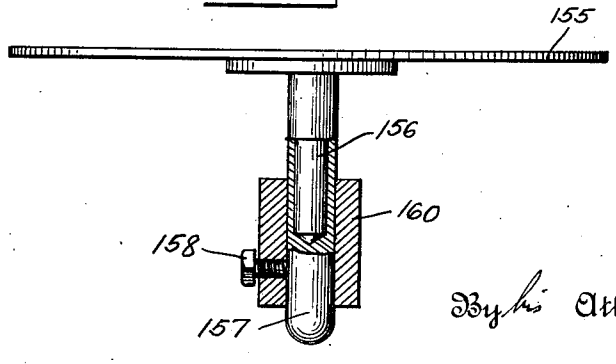


Fig. 7.



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UNITED STATES PATENT OFFICE.

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CAN-OPENING MACHINE.

1,405,066. Specification of Letters Patent. Patented Jan. 31, 1922.

Application filed June 18, 1921. Serial No. 478,465.

To all whom it may concern:

Be it known that I, CHARLES O. NICOLAI, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Can-Opening Machines, of which the following is a specification.

The principal object of this invention is to provide a machine adapted to opening cylindrical tin containers of the type generally used for holding canned fruits, preserves, meats, paint and other commodities.

Another object is to produce means whereby tin containers may be opened in a neat and expeditious manner without manual labor.

A third object is in the provision of means for separating the tops or bottoms from the bodies of containers without damaging or spilling the contents.

These and other objects are attained by the novel construction and arrangement of parts described in the specification and shown by the accompanying drawings in which:—

Figure 1 is a side elevational view of a can opener made in accordance with the invention in normal position prior to operation.

Figure 2 is a partial side elevational view of the same in operating position, parts being broken away to disclose concealed details.

Figure 3 is a transverse sectional view taken on line 3—3 of Figure 1.

Figure 4 is a similar sectional view taken on the same line looking in the direction of the arrows.

Figure 5 is a vertical sectional view taken on line 5—5 of Figure 2.

Figure 6 is a transverse sectional view of the clutch device taken on line 6—6 of Figure 2.

Figure 7 is an enlarged sectional view taken on line 7—7 of Figure 1.

Referring to the drawings in detail, the numeral 15 indicates the base of the machine attached to a frame or bench 16 having legs 18 and 19.

A vertically disposed hollow, rectangular column 20 is rigidly secured at one end to the base 15 and attached to the opposite end is a forwardly extending plate 22 upon which is attached a pillow block 24.

In this block is rotatably mounted a drive shaft 26 extending rearward and passing through another pillow block 28 secured to the upper end of an open sided column 30, its lower end being attached to the rear end of the base 15 by the screws 31.

A pulley 34, having an extending hub 35 provided with diametrically opposed pins 36, is rotatably held upon the shaft 26. A clutch sleeve 38 provided with corresponding pins 36′, and a key way adapted for slidable engagement upon the shaft 26 and the key 39.

The clutch sleeve is brought into engagement with pulley hub by action of the lever 40, provided with fork fingers 41 engaging in an annular groove 42 formed in the clutch sleeve, the lever being pivotally secured in brackets 44 fixed to the rear column 30.

Disengagement of the clutch members is effected by the spring 45 shown in Fig. 2 as being attached at one end to the bracket 44, the other end acting against a pin 46 positioned on the lever 40.

Secured upon the forward projecting end of the shaft 26, adjacent the outer end of the pillow block 24, is a bevel pinion 48 in mesh with a bevel gear 50 secured to a stud 51 projecting upwardly through a bearing formed within a boss 52 integral with the plate 22.

Fixed upon the stud 51, adjacent the lower face of the plate 22 is a spur gear 54 and a circular knife 58, secured to lower end of stud 51, is separated by a collar 59 from the gear 54, providing a clearance space.

An annular flange 61, integral with another circular knife 62 enters the space and is secured to the end portion of a stud 64, the latter passing upwardly and being rotatably mounted in a bearing formed within a boss 65 integral with a slide 68 adapted to move upon the upper face of the plate 22.

The slide 68 is provided with a lower element of narrowed width adapted to engage within an elongated opening formed through the plate 22, preventing side motion, but permitting lineal movement so that a spur gear 70, fixed to stud 64, positioned adjacent the underside of the plate 22, and the circular knife flange 61, may be drawn back into mesh with the spur gear 51, a collar 72 holding the stud rotatably in the bearing 65.

Guide bars 75 engage the upper side of the slide 68 and are held by collars 76 and screws

77. A parallel reciprocating motion is imparted to the slide 68 by a pair of links 80 pivotally attached to the sides by screws 81 passing through collars 82. The rear ends of the links are provided with openings engaging hub elements 84 integral with the arms 85, having annular openings disposed off the common centers of the hubs 84, forming eccentrics when rotated upon the screws 86, washers 87 being provided for retaining the elements 80 and 84 in engagement.

A pair of connecting rods 90 are screw threaded on their ends to adjustably engage their heads 91, and 92 respectively at their upper and lower ends, the heads 91 being pivotally secured to the arms 85 by screws 95.

An actuating sliding unit, comprising a front plate 100 positioned adjacent the front face of the column 20, is provided with a cross bar 103 which passes a slot 102 in the column, connecting a vertically positioned plate 104, to which is fixed a shorter vertical element 105.

Another cross bar 106, connecting the lower ends of the plates 100 and 104, forms a unit adapted to pass through an opening 108 formed through the base 15 and is provided with means for attaching a treadle bar 110 to the lower portion by the bolt 112.

A spur pinion 115 secured to the drive shaft 26 is in mesh with a spur gear 116, to the inner side of which is secured, by screws 117, a spaced concentric disc 118 having at one point on its circumference a deeply cut notch 119 forming a quick rise and drop cam.

A stud 120, secured to the rear wall of the column 20 and extending outward, provides a bearing on which the gear 116 and cam 118 are rotatably mounted.

A further extension of the stud passes through an opening in a vertically disposed supporting bar 125 and is secured thereto by a nut 126, the upper end of the bar 125 has an arcuately shaped end, and is provided with an opening through which the shaft 26 freely passes, the opposite end of the bar being attached to the base of the machine.

A stud 130, fixed in the slide elements 104 and 105, projects outwardly through an elongated opening formed in the rear wall of the column 20, has rotatably mounted thereon a flanged cam roll 132 engageable with the disc cam 118.

A clutch lever slide 135, is slidably secured adjacent the front side of the bar 125, its upper end being held by a screw 138 operating within a slot 139 of the bar 125.

A stud 140, is provided with an enlarged band 141 adapted to engage the cam roll 132, a reduced portion of stud being rigidly secured in the slide 135 and extending outwardly through a slot 142 formed in the bar 125, is supported by a washer 143 and 144.

A forked bracket 150, operating within an opening through bar 125, is rigidly attached to the slide 135, the projecting forked end engaging with a pin 152 secured to lower ends of clutch lever 40.

A circular table 155, adapted to carry a conventional type of round cam, as indicated in broken lines in Figs. 1 and 2, and having a centrally located flanged pivot pin 156, is rotatably mounted in a vertically adjustable collet 157, secured by a set screw 158 passing threadably through the forward wall of a rectangular block 160 provided with a pair of oppositely disposed extending trunnions.

The end portions of these trunnions are pivotally engaged within annular openings provided in the vertically positioned slides 162 slidably held by guides 164 attached to the forwardly extended upright elements of the base 15.

A pair of arms 168 are pivotally mounted upon a bolt 169, secured to frame 15 by a nut 170, and spacing collars 171 are provided to hold the arms in parallel position.

An open ended slot, forming a fork 172, is provided at the front end of the arms is adapted to engage the trunnions adjacent the block 160, and a cam element 175 is rigidly attached to upper edges at the rear ends of the arms 168.

A pair of brackets 180 are secured to the column 20 adjacent the slide 100 and provided with a bolt 181 passing pivotally through a double ended cam roll carrier lever 184 having forked ends in which are rotatably mounted cam rolls 186 on pins 187 secured in the ends of the carrier.

A bar cam 190, having an arcuate lower end adapted to engage the roll 186, forms an integral element of the slide 100.

An operating foot lever 195, has an up turned rear portion pivoted to a leg member 19, and a foot plate 196 is attached to its front end, a bolt and nut 197 providing pivotal connection with the treadle bar 110. This bar carries a projecting clip 198 to which is attached the lower end of a spring 199, its upper end being held by a clip 200 fixed to the under side of the table 16.

In operation a container is placed upon the rotatable turntable, with the machine in inoperative position as shown in Figure 1.

Referring to Figure 2 it will be seen that by depressing the foot lever, the container is raised into cutting position, and the circular knives are drawn together.

Further downward motion of the lever simultaneously releases the disc cam from the locking roll and engages the clutch mechanism, this engagement being maintained through one complete revolution of the disc cam, during which period the cam or container, rotated by the friction of the knives, will have made one or more complete revolutions—depending upon the diameter of the container—and the separation of the cover effected.

Disengagement of the clutch, release of the knives and lowering of the can, ready for replacement are automatically provided for in the practical and efficient manner described.

From the foregoing it will be seen that a simple device for this purpose has been disclosed in the preferred form of its embodiment, but it is not desired to restrict the details to the exact construction shown, it being obvious that changes, not involving the exercise of invention, may be made without conflicting with the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A can opening machine comprising a stand, columns on the stand, a shaft mounted horizontally on said columns, said shaft having a loose driven pulley, a slide on one of said columns, means for normally raising said slide, a cam rotatable on the column centrally said slide, said cam being driven by said shaft, a pair of rotary shears actuated by the shaft, said shears being adapted to operatively engage the edge of a can, means for separating said shears pinion to the entrance of a can, means combined with said slide for raising the can, a clutch for engaging said pulley and shaft, said clutch being operated by said slide, and a single pedal for depressing said slide.

2. In a power driven can opening machine, comprising in combination with a pair of opposed rotary knives and a turn-table receptive of a can, of a clutch on said shaft whereby rotary motion is conducted to said knives, a gear train driven by said shaft, a cam actuated by said gear train, a slide controlled by said cam, said slide maintaining the clutch in engagement during one full revolution of the cam, and means for inserting the edge of a can between said knives, said means being actuated by said slide.

3. In a power driven can opener, the combination with a spring opposed foot lever, a freely revoluble turn-table adapted to receive a can, and a pair of rotary knives adapted to shear the top of the can, of a vertical slide operated by said lever, means actuated by said slide operating in sequence to raise said table, to cause said knives to engage on opposite sides of the rim of the can, to positively maintain the can in a raised position during the operation of said knives whereby the can is turned one complete revolution, and to release said slide at the completion of the cutting operation.

In witness whereof I affix my signature.

CHARLES O. NICOLAI.