Feb. 16, 1932. G. P. AMES 1,845,213

CAN OPENING MACHINE

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Fig. 1.

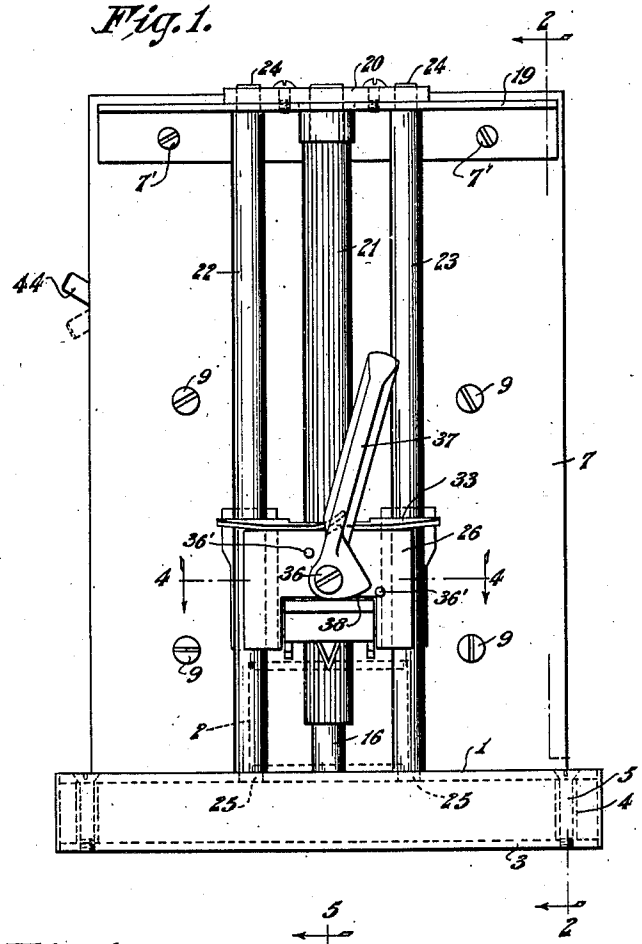
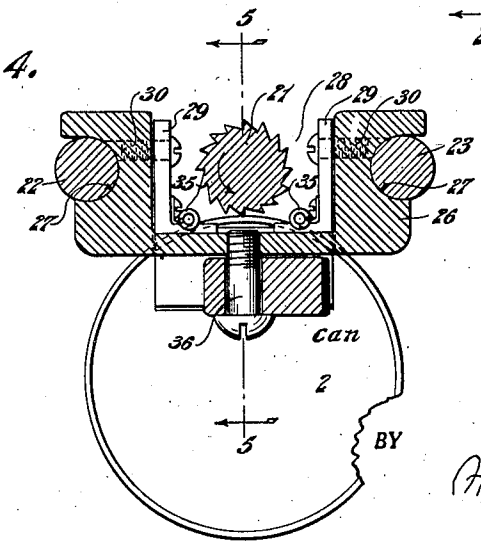


Fig. 4.



INVENTOR,
George P. Ames,

BY
Harry W. Bowen.
ATTORNEY.

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Fig. 2.

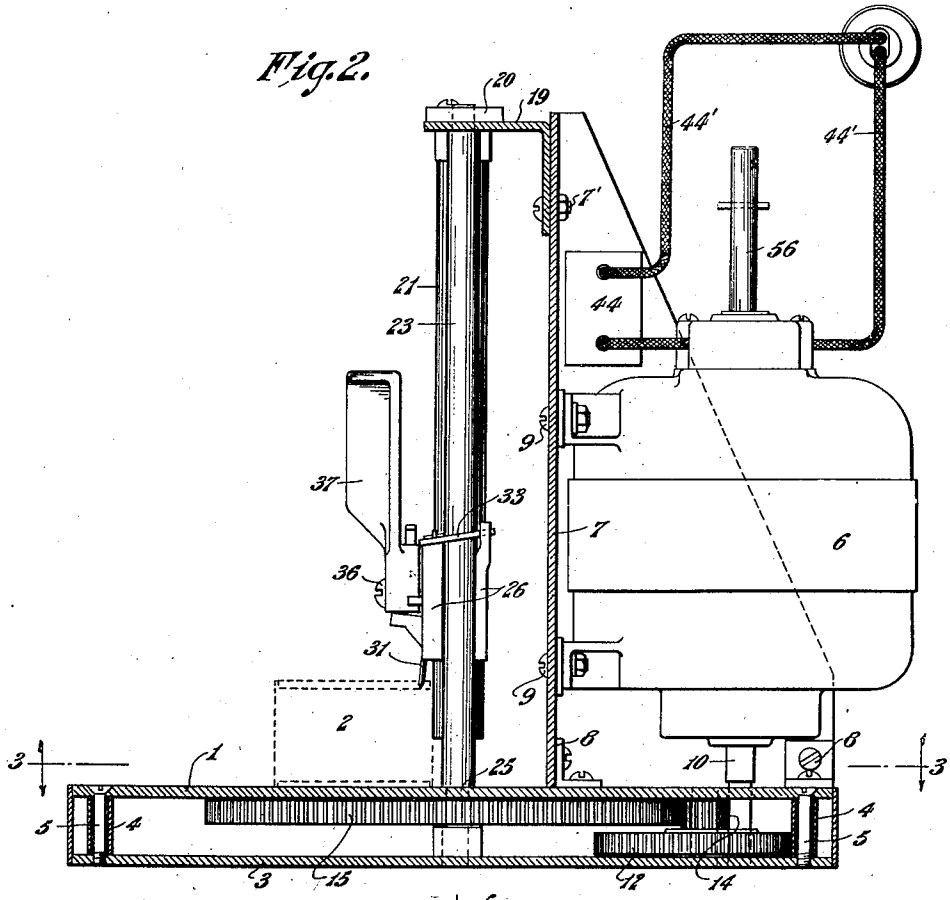
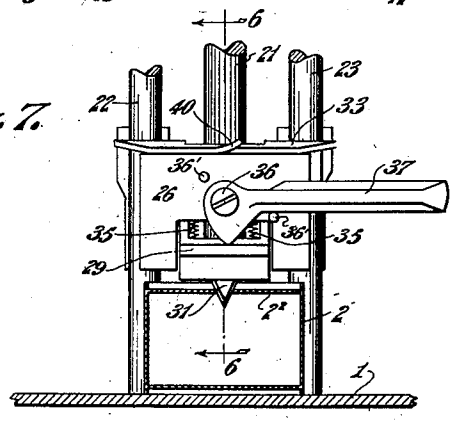


Fig. 7.



INVENTOR,
George P. Ames,

BY

Harry W. Bowen.
ATTORNEY.

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CAN OPENING MACHINE

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Fig. 3.

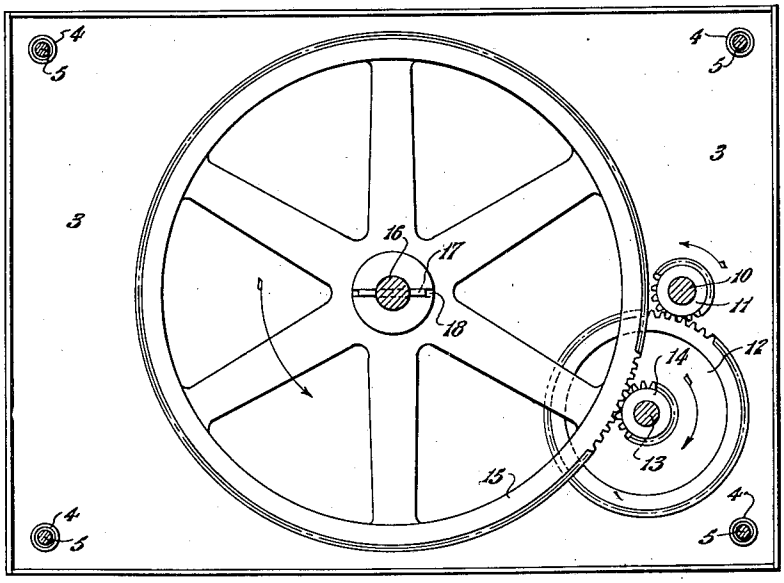


Fig. 5.

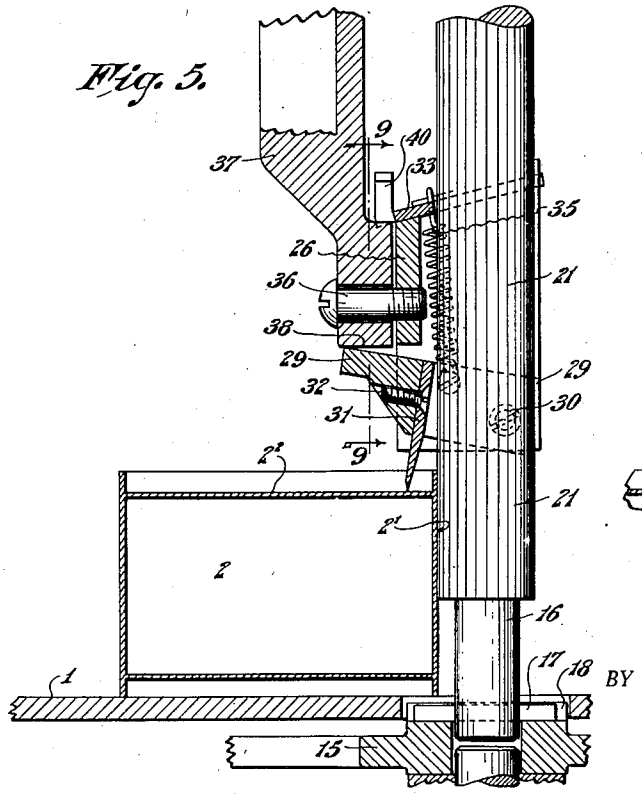
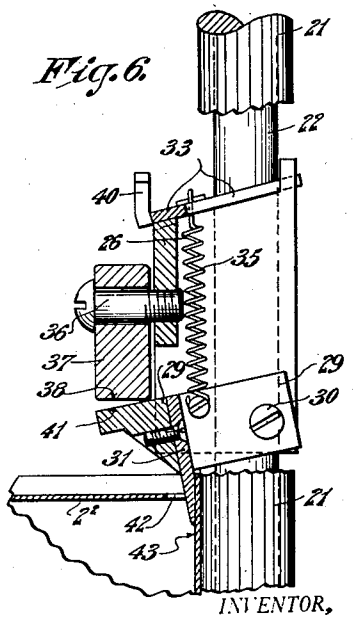


Fig. 6.



INVENTOR,
George P. Ames,

BY
Harry W. Bowen.
ATTORNEY.

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CAN OPENING MACHINE

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Fig. 8.

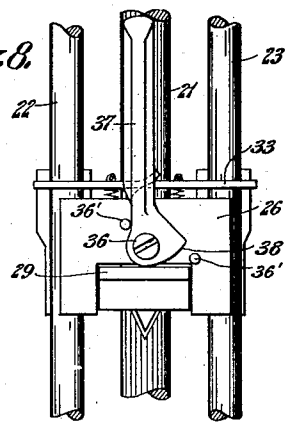


Fig. 9.

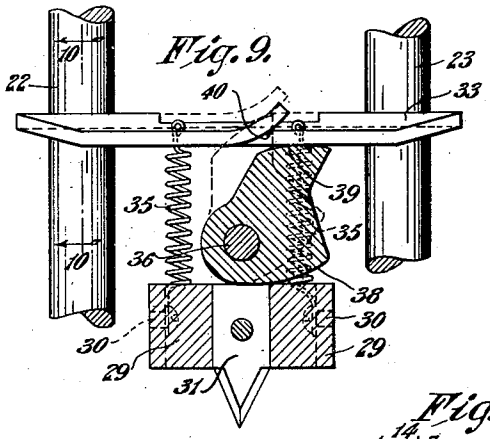


Fig. 10.

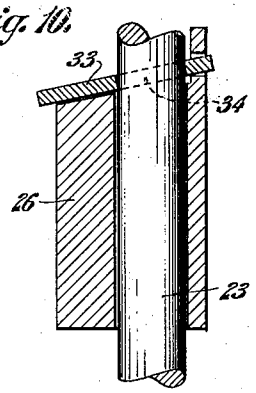


Fig. 11.

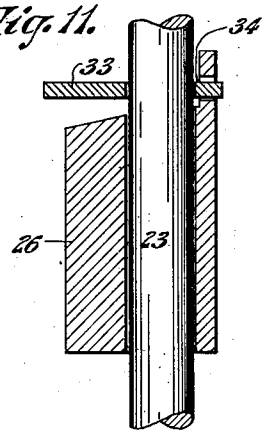


Fig. 12.

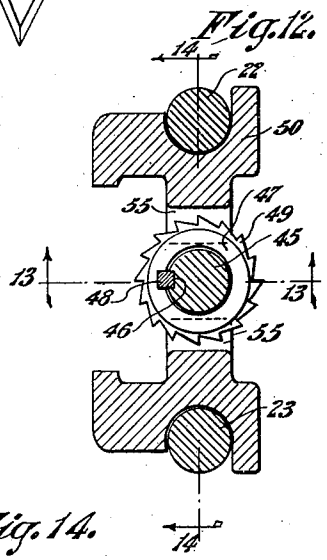


Fig. 13.

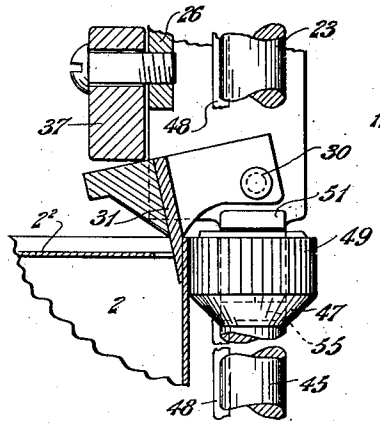
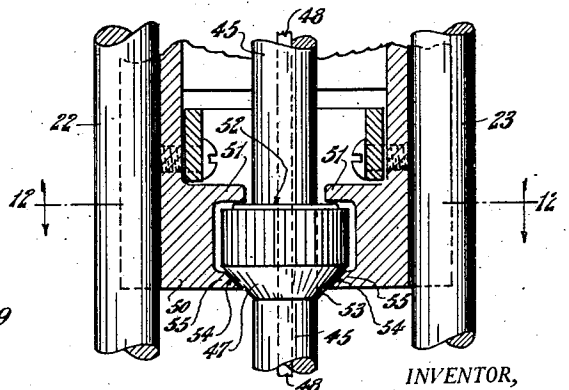


Fig. 14.



INVENTOR,
George P. Ames,

BY

Harry W. Bowen
ATTORNEY.

Patented Feb. 16, 1932

1,845,213

UNITED STATES PATENT OFFICE

GEORGE P. AMES, OF SPRINGFIELD, MASSACHUSETTS

CAN OPENING MACHINE

Application filed May 26, 1930. Serial No. 455,517.

This invention relates to improvements in can opening machines of the type in which power is applied for operating the machine.

An object of the present invention is to provide a structure which, when a can to be opened, is placed on the platform and the cutter blade is moved into its operative cutting position, the can will be automatically rotated, and the cover severed, when the motor circuit is closed.

A further object is to provide a can opening machine, which will accommodate cans of different heights and diameters, as well as rectangular-shaped cans.

Means is provided for moving the can, with suitable pressure, against a fluted or toothed can rotating or driving member, when the cutter blade is forced through the cover, whereby it will be rotated by this member during the cutting operation.

Broadly, the invention comprises a platform on which the can to be opened is placed. An electric motor is mounted on the platform; a can rotating member, which is formed with teeth, or grooves, for engaging the periphery of the can for indenting the edge of the same is employed, whereby, when the driving member is rotated, the can will also be rotated, during the cutting operation.

The means for automatically moving a can towards the toothed driving member, when the cutter is forced through the top, or cover, comprises a pair of guide rods on which a cross head carrying a cutter is mounted; a lever with two cam surfaces which performs the double function of causing the automatic clutching of the carrier to the guide rods and for forcing the cutter through the top of the can, and which, as stated, moves the can against its driving member. These and other objects will appear in the body of the specification, and will be particularly pointed out in the appended claims.

Referring to the drawings:

Fig. 1 is a front elevational view of the machine showing the can-receiving platform with the guide rods, the fluted or toothed can driving member and the operating cam lever in its neutral position.

Fig. 2 is a side elevational view, partly in section, of Fig. 1, showing the gear train operatively located between the shaft of the driving motor and the can rotating member and with the cam lever in its neutral position.

Fig. 3 is a horizontal sectional view on the line 3—3 of Fig. 2 showing the train of gearing.

Fig. 4 is a horizontal sectional view on the line 4—4 of Fig. 1 illustrating the follower member on the guide rods, the knife carrying member pivotally attached to the follower member and which carries the cutter, also illustrating a can in top plan view and the operating lever in section.

Fig. 5 is a vertical sectional view on the line 5—5 of Fig. 4 showing the can driving member with a can in engagement therewith and the follower member with the cutter knife prior to its entrance through the upper end of the can.

Fig. 6 is a vertical sectional view on the line 6—6 of Fig. 7 showing the cutter knife, after its entrance through the top of the can which forces the outer upper peripheral side of the can against the fluted driving member.

Fig. 7 is a front elevational view of Fig. 6 in full line with the cam operating lever in its lowered position.

Fig. 8 is a view similar to Fig. 7 with the cam operating lever elevated to free the clutch plate.

Fig. 9 is a detail sectional view on the line 9—9 of Fig. 5 showing the clutch plate which is freely mounted on the upper end of the follower member and serves to clutch the follower on the guide rods to permit the blade carrying member to be raised on the guide rods or automatically clamped thereto, when the cam lever is in its normal position, also showing the cam lever, the contractile springs, the knife carrying member and knife.

Fig. 10 is a sectional view on the line 10—10 of Fig. 9 showing the clutch plate in its operative position.

Fig. 11 is a view similar to Fig. 10 with the clutch plate in its inoperative position.

Fig. 12 is a horizontal sectional view of a modification in which the can driving mem-

ber, instead of being fluted, or toothed its entire length, comprises a fluted or tooth formed member that is short in length and slidably mounted on the driving shaft.

Fig. 13 is a vertical sectional view on the line 13—13 of Fig. 12, with the knife in the lowered operative cutting position, and

Fig. 14 is a vertical sectional view on the line 14—14 of Fig. 12, showing the short toothed member.

Referring to the drawings in detail:

1 designates the platform on which the can to be opened is placed, that is indicated by the reference numeral 2; 3 is a base plate spaced from the plate 1 by the sleeves 4 and screws 5. 6 indicates the electric drive motor that is secured to the vertically arranged plate 7 that is attached to the platform 1 with the angle irons 8. The motor is secured to the plate 7 with the bolts 9. The shaft 10 of the motor passes downward through the platform 1 and carries the pinion gear 11 which meshes with the larger gear 12 secured to the shaft 13 on which shaft is the pinion gear 14 that meshes with a still larger gear 15.

The gear 15 is connected to the fluted or toothed can driving member by means of the cross pin 17, which enters a recess 18 in the upper or hub portion of the gear 15.

Secured to the upper end of the plate 7, with the bolts 7', is an angle iron piece 19 on which is placed a bearing plate member 20 for the upper end of the toothed shaft 16. This shaft 16 is formed with the flutes or milled teeth 21 that extend substantially its entire length. Located on opposite sides of the milled shaft 16 are the two guide rods 22 and 23.

The bearing plate 20 is formed with openings to receive the reduced upper ends 24 of the rods 22 and 23. The lower ends of these rods are reduced in diameter and enter openings in the platform 1, as indicated at 25.

Slidably mounted on the guide rods 22 and 23 is a carrier or block member 26 which is recessed, as shown at 27, to fit the two guide rods.—This block member is formed with a recess or opening 28 and in this opening is placed the fluted can driving member 16. Pivotally connected to the block member 26 is the right angular-shaped member 29 by means of the pivot screws 30. Secured to the member 29 is the cutter blade or knife 31 by means of the screw 32. Mounted on the guide rods 22 and 23 is the follower clutch plate 33 which is formed with the openings 34 that receive these guide rods. This plate is connected to the cutter blade carrying member 29 by means of the two contractile springs 35, which provides a floating connection between the clutch plate 33 and the pivotal member 29.

Pivotally mounted on the follower member 26 by means of the pin 36 is the cam operating lever 37 which is formed with the two cam surfaces 38 and 39. This lever performs two functions. When in the position shown in Fig. 8, the surface 39 engages the upturned portion 40 of the plate 33 for moving this plate upward, as shown in Fig. 11, for unclutching it from the guide rods 22 and 23. The knife may now be raised and lowered, since the plate is now in the parallel position, shown in Fig. 11. When in this position, the plate 33 is not clutched to the rods 22 and 23 and may be readily moved, with the carrier member 26, the pivoted member 29 and knife 31 upward or downward on these rods. When a can is placed on the platform 1, with its outer curved surface 2' against the fluted, or toothed, member 16, the knife is then brought downward into the position shown in Fig. 5 which rests on the cover 2^2. This operation is made with the lever 37 in the vertical position. The cam lever 37 is now moved from the vertical position, shown in Figs. 8 and 5 downward, into the position shown in Figs. 6 and 7, whereby the cam surface 38 engages the upper surface 41 of the knife carrying member 29 and forces the cutter blade 31 through the top of the can cover, as shown by the opening 42, and against the inner surface 43; this operation serves to retain the can firmly against the fluted, or toothed, member 16. The plate 33 is now clutched to the guide rods. When the motor switch 44 is closed, as shown in Fig. 2 and the motor set in operation, the can will be rotated through the train of gears, located between the drive shaft 10 of the motor and the toothed shaft 16, which operation causes the can 2 to be rotated on the platform and the sharp forward edge of the knife 31 will cut or sever the cover 2^2. The parts are held in this position until the cover is completely severed. The lever 37 is then turned into the vertical position which frees the clutch plate and permits the cutter blade to be withdrawn from the inner surface of the can. The open can may then be removed from the platform, after the cutter carrying parts are moved upward on the guide rods 22 and 23. They will be automatically locked in the elevated position, as soon as the lever 37 is released, as it will return to its neutral position, shown in Figs. 1 and 9, actuated by the springs 35. In other words, the springs 35 operate to automatically lock the plate 33. 36' are stop pins for the lever 37 for limiting its extreme movements.

Referring to Figs. 12, 13 and 14, the fluted or toothed member 16 is replaced by the shaft 45 having the spline groove 46 formed its entire length. 47 is a toothed can driving member, that is slidably connected to the splined shaft 45 by means of the key 48. This member 47 is formed with the teeth 49. For the purpose of raising and lowering the can driving member 47, the member 50 is formed with the upper and inwardly ex-

tending portions 51, which engage the upper hub surface 52 of 47. The member 47 is formed with the downwardly inclined bottom portion 53 against which rests the inclined portion 54 of the lower inwardly extending arms 55, whereby when the member 50 is raised by the lever 37, the member 47 will be moved upward on this splined shaft 45, and when the member 47 is to be lowered, the portions 51 will move 47 downward into its operative position, as shown in Fig. 13. The inclined lower portion 53 is for the purpose of preventing the can 2 from being placed under the toothed member 47. The subsequent operations of severing the cover are identical with that already described above. The main current supply wires are shown at 44'.

What I claim is:

1. A can opening machine comprising a can supporting member, a cutter, a can rotating member, means for simultaneously forcing the cutter through the cover of a can and moving the can against the rotating member, means for operating the same, and means for automatically retaining the cutter in its operative position, said means comprising guide rods, a carrier on the rods for the cutter, a clutch plate engaging the guide rods and springs connecting the clutch plate and carrier.

2. In combination, in a can opening machine, a can rotating member, a can supporting platform, a cutter, a carrier therefor, guides for the carrier, a clutch member in the guide and connected to the carrier, means for releasing the clutch member and for moving the can into contact with the said rotating member and means for operating the can rotating member.

3. In combination, in a can opening machine, a can rotating member, a can supporting platform, a cutter, a carrier therefor, guides for the carrier, a clutch member in the guide and connected to the carrier, means for releasing the clutch member and for moving the can into contact with the said rotating member, and means for operating the can rotating member, said means comprising a toothed member, a motor and operative connections between the motor and the toothed member.

4. In a can opening machine, the combination, a toothed can rotating member, a knife, means for forcing the knife through the cover and at the same time into engagement with the toothed member, means for retaining the can against the said member and means for rotating the member, said means comprising guide rods, a clutch member engaging the rods and spring means for operating the clutch.

5. In a can opening machine, the combination, a toothed can rotating member, a knife, means for forcing the knife through the cover and at the same time into engagement with the toothed member, means for retaining the can against the said member, and means for rotating the member, said means comprising guide rods, a clutch member engaging the rods, spring means for operating the clutch, and means for releasing the clutch comprising a lever with a cam surface for engaging the clutch against the tension of the springs.

6. In a can opening machine, a knife, a carrier for the knife to which the knife is pivoted, guide rods therefor, a clutch plate on the rods, a spring for normally rendering the clutch operative, a lever having two cam surfaces, one for releasing the clutch and the other for forcing the knife through the cover of the can, a can rotating member, the construction and arrangement being such that the spring will automatically retain the lever in its normal or inoperative position.

In testimony hereof, I have subscribed my name this 16th day of May, 1930.

GEORGE P. AMES.