P. KRUSE.

MACHINE FOR WORKING ON CANS.

APPLICATION FILED OCT. 8, 1915.

1,333,084.

Patented Mar. 9, 1920.

3 SHEETS—SHEET 1.

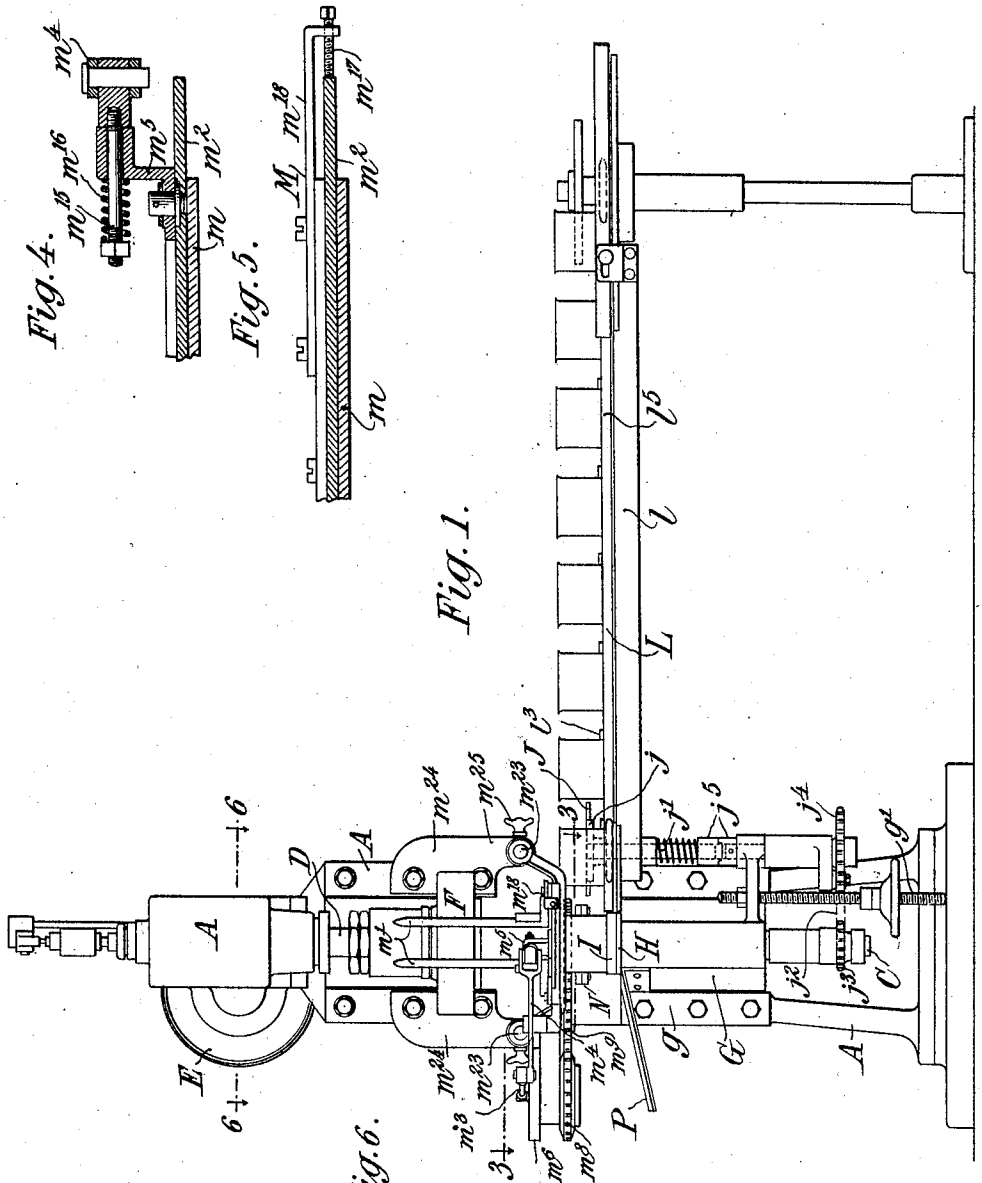


Fig. 1.

Fig. 4.

Fig. 5.

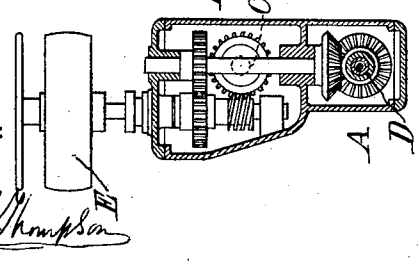


Fig. 6.

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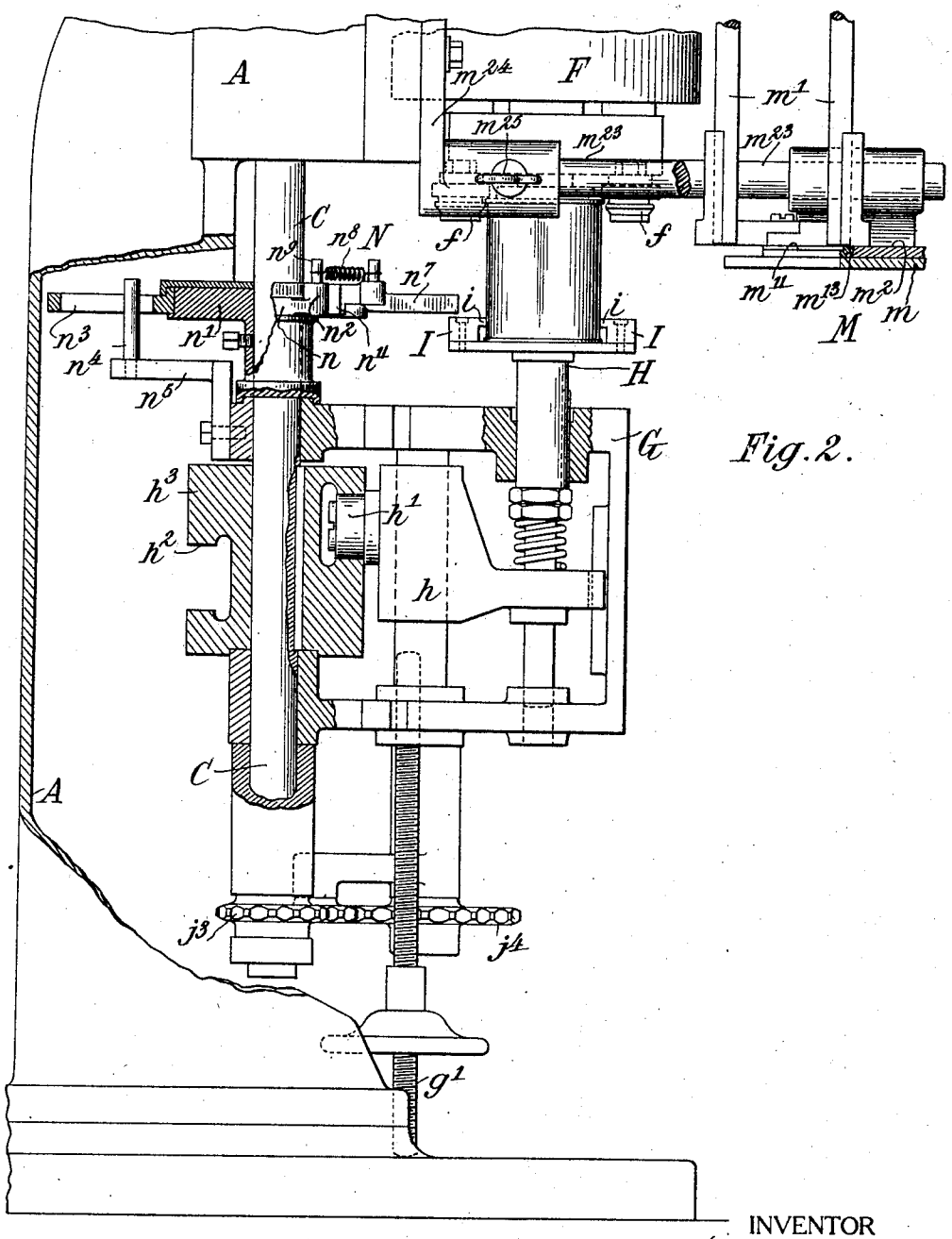


Fig. 2.

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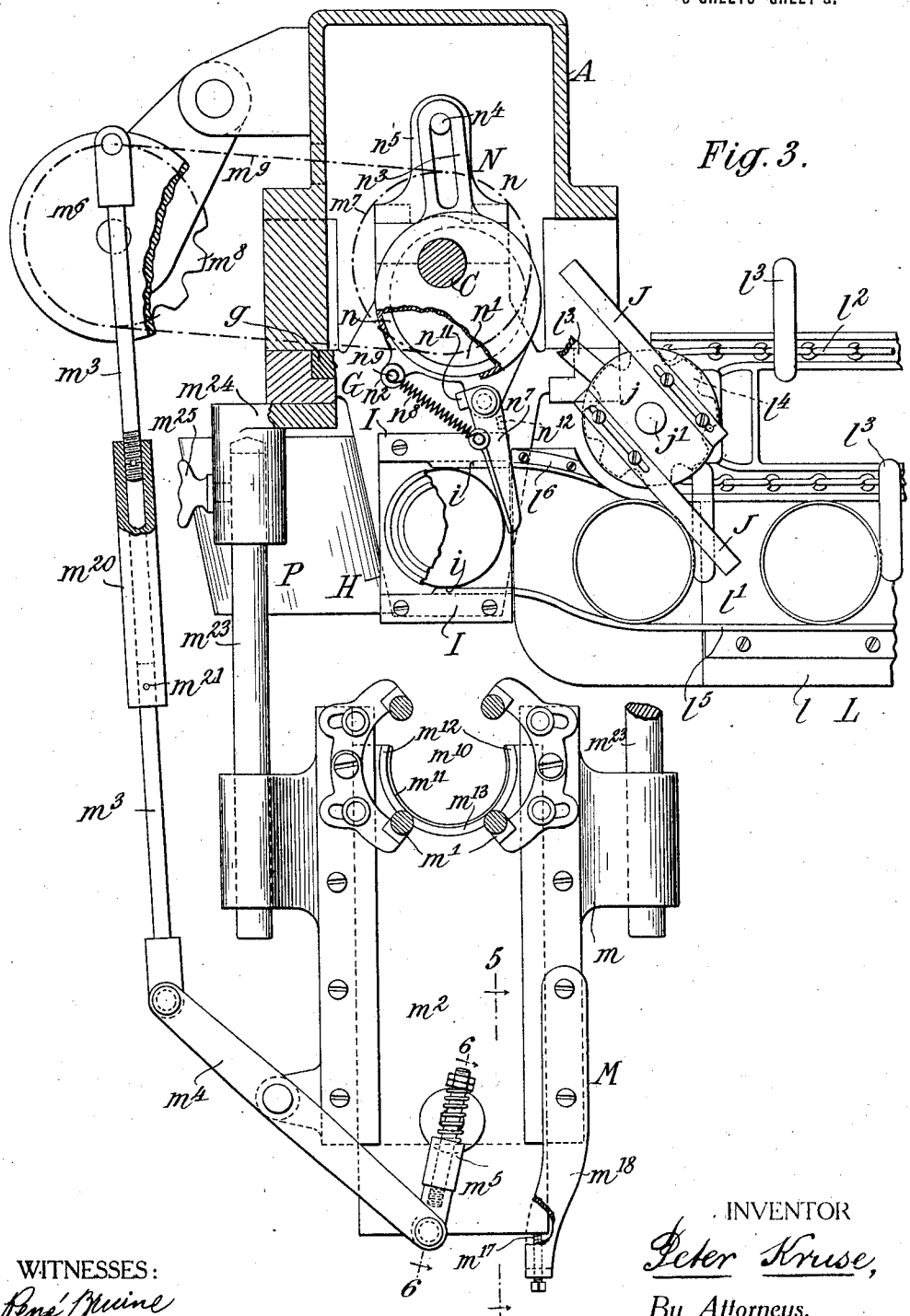
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3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

PETER KRUSE, OF BROOKLYN, NEW YORK, ASSIGNOR TO E. W. BLISS COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF WEST VIRGINIA.

MACHINE FOR WORKING ON CANS.

1,333,084. Specification of Letters Patent. Patented Mar. 9, 1920.

Application filed October 8, 1915. Serial No. 54,756.

To all whom it may concern:

Be it known that I, PETER KRUSE, a citizen of the United States of America, residing in the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Machines for Working on Cans, of which the following is a specification.

This invention relates to machines for working on cans, particularly machines for seaming heads or ends on cans or can-bodies, and aims to provide improvements therein.

The present invention provides a can-working or seaming machine in which the general construction is much simplified. The invention also provides a simplified and improved means for feeding the can-heads or ends; a simplified and improved means for ejecting the cans from a seaming or other working position; and a simplified and improved means for properly positioning the cans or bodies in the seaming or other working position. Certain features of the invention are applicable to other types of metal working machines.

Other features of improvement will be hereinafter pointed out.

An embodiment of the invention is illustrated in the accompanying drawings, wherein—

Figure 1 illustrates a front elevation of the machine;

Fig. 2 a side view, with parts broken away and in section, of the lower part of the machine;

Fig. 3 a horizontal sectional view on the line 3—3, Figs. 1 and 2.

Figs. 4 and 5 are detail views of parts of the feed mechanism, on the lines 4—4 and 5—5 respectively, Fig. 3;

Fig. 6 is a detail sectional view on the line 6—6, Fig. 1, illustrating the driving connections.

In said drawings the letter A designates the column constituting the main frame of the machine. In the column are suitably mounted two vertical shafts C and D, which may be suitably driven by a pulley E. The shaft D is adapted to rotate at a higher speed than the shaft C, and carries a seaming head F of any suitable construction having the seaming rolls f, f thereon. G designates the table, which preferably has a sliding connection g with the column A, the height of the table being adjustable by means of the threaded shaft g^1 with hand-wheel.

The table G has mounted therein the pad or plunger H, which acts to lift the cans into the position where they are acted upon by the seaming rolls. The pad H is lifted by a sliding block h having a roller h^1 which fits within a cam groove h^2 in a block h^3 keyed upon the shaft C.

Means are preferably provided for properly locating or positioning the can bodies under the seaming rolls. This means preferably comprises a guide, or a pair of guides I, preferably attached to the pad H, and a finger or fingers J adapted to push the can-bodies upon the pad H between the guides. The guides i are adapted to position the can-bodies symmetrically with respect to a plane passing through the axis of the seaming head. The guides I are preferably provided with undercut, and slightly converging ribs i, the ribs being so spaced from one another that they oppose with slight friction the movement of the can-bodies between them. The finger or fingers J are preferably mounted upon a rotating disk j which is carried by a shaft j^1 suitably driven from the vertical shaft C through a chain j^2 and sprockets j^3, j^4. The shaft j^1 is preferably made in two parts and connected by a slip connection j^5. The slip connection is of importance, and permits the sprockets and the lower part of the shaft to continue to rotate when a jam occurs which prevents the action of, or places an undue strain upon, the fingers J.

A suitable means L may be provided for feeding the cans into position to be acted upon by the fingers J. This means may comprise a table l having a slideway l^1 thereon, and an endless chain l^2 having fingers l^3 adapted to push the cans along the slideway. The chain l^2 may be driven by a sprocket l^4 upon the shaft j^1. The table l preferably has an adjustable guide strip l^5 thereon. A guide strip l^6 may also be provided.

The fingers J are preferably adjustable, as by means of slots therein through which the fastening bolts pass, whereby the extent to which the can-body is pushed between the guides on the pad H may be nicely adjusted.

The machine may also comprise the improved means M for feeding can-heads or

ends on to the can-bodies. This means preferably comprises a table m having a suitable magazine or hopper m^1 thereon for holding a stack of can-heads or ends, and a slide m^2. The slide m^2 may be reciprocated by means of the rod m^3, the lever m^4 and the link m^5, the rod m^3 receiving motion from a crank disk m^6, which latter may be suitably driven from the vertical shaft C through sprockets m^7, m^8, and a chain m^9. The slide m^2 is provided with an arcuate opening m^{10} therein, the length of the arc being somewhat greater than a semi-circle. The diameter of the opening is slightly less than that of the can-heads or ends, and the edge of the slide adjacent the opening is grooved, so as to provide a ledge m^{11} upon which the edges of the can-heads or ends are adapted to rest. The distance between the inflected or incurved ends of the opening is such that a can-body may pass between the same, and the portions m^{12}, m^{12} of the slide at the inflected ends of the opening are such as to prevent a can-head or end which is resting upon the ledge m^{11}, from passing horizontally off of the slide. The ledge m^{11} is preferably formed in a separate piece of metal m^{13} set into the slide m^2, the part m^{13} being capable of substitution, whereby other inset portions may be substituted to provide for the use of different sized can-heads or ends in the machine.

The throw of the slide m^2 is such that the center of the opening, at one limit of the reciprocation, will be under the center of the stack of can-heads in the magazine m^1, and at the other limit of its reciprocation, under the axis of the seaming head.

As shown in Fig. 4, the lever m^4 is resiliently connected to the pivoted link m^5 by means of a rod m^{15} and spring m^{16}. This construction permits of a movement of the lever m^4 after the slide m^2 has been stopped, a stop m^{17} being provided for stopping the slide slightly before the end of an oscillation of the lever m^4, thereby providing a dwell of the slide beneath the magazine m^1. The stop m^{17} is preferably adjustable upon an arm m^{18}, thereby permitting of nicely adjusting the stopping of the slide beneath the magazine. The dwell of the slide beneath the magazine facilitates the proper reception of the lowermost can-head or end upon the ledge m^{11} of the slide.

In order to minimize damage owing to a jam in the can-head feeding mechanism, the rod m^3 is preferably made in two parts, and the ends connected by a sleeve m^{20}, the connection at one of the ends being a shear pin m^{21} which is adapted to shear when there is undue strain upon the rod m^3.

The table m is preferably supported by rods m^{23} fitting in sockets in brackets m^{24} attached to the column A. Wing nuts m^{25} serve to fasten the rods m^{23} in the sockets. The can-head feeding mechanism M may be quickly and conveniently detached from the machine by loosening the nuts m^{25} and disconnecting the rods m^{23}. This permits of readily clearing the front of the machine, where the mechanism M is located in the front of the machine.

The machine preferably comprises means N for ejecting the cans from the position beneath the seaming rolls, after the heads or ends have been seamed on the can bodies. This means preferably comprises a collar n fitting upon an eccentric n^1 keyed upon the vertical shaft C. The collar n has a slotted tail n^3 which fits over a pin n^4 on a bracket n^5 attached to a fixed part of the machine. The collar n has a pivoted finger n^7 thereon, the finger n^7 being acted upon by a spring n^8 attached at one end to a pin on the finger, and at the other end to a stud n^9 on the collar n. The finger n^7 has a stop n^{11} which by coming into contact with the collar n limits the movement of the finger under the pull of the spring. Another stop n^{12} may be provided on finger n^7 for preventing (by coming into contact with the collar n) movement of the finger across its dead center with relation to the spring. The action of the eccentric upon the collar n is to give the finger n^7 an approximately elliptical orbital movement. The path of movement of the finger n^7 is such that the finger n^7 moves to a position at the side of a can, the further movement of the finger pushing the can body from between the guides I (and from beneath the seaming rolls) on to the deflecting plate P (or other suitable means for carrying off the cans) down which the cans slide off the machine. The finger n^7 then moves rearwardly out of the way of a can body which may be being moved into position beneath the seaming rolls. The finger n^7 then completes its orbit by again moving into position to push off the next can. The tension of the spring n^8 is greater than the effort normally required to push the cans from beneath the guides. In case, however, a jam occurs in the path of the finger n^7, the spring n^8 permits the finger to yield and thereby pass around a jammed can.

Operation: The cans or bodies brought to the machine by the feeding means L are pushed onto the pad H by the fingers J. The guides I exert a slight pressure upon the sides of the can and guide the can to a position symmetrical to one plane passing through the axis of the seaming head. The length of the arms J is such that the can bodies are pushed to a position on the pad symmetrical with respect to a plane passing through the axis of the seaming head at right angles to the first plane. The can body is then symmetrical with relation to the axis of the seaming head. In case of

a jam occurring in the path of the fingers J, the slip connection j^5 permits the feed fingers to remain immobile while the driving connections continue to run.

While the can bodies are being moved on to the pad a can-head or end is being moved from the bottom of the magazine to a position under the seaming head, over the can body. The pad H is then raised, the timing of the can-head feed being such that the rising can body lifts the can-head or end off of the ledge m^{11} on the slide m^2, and carries the can-head or end against the chuck on the seaming head, in which position the can-head is seamed to the can body. The width of the opening m^{10} in the slide m^2 is such that the slide may move away from the can body, without binding, as the slide is moved rearwardly to take up another can-head from the magazine. After the head is seamed on the can body, the pad H, and the can thereon, drop, the can is engaged by the finger n^7 and is pushed on to the plate P, from whence it passes from the machine. In case a can body is not on the pad H when the slide m^2 moves forward, the can-head is carried back by the slide, the can-head being retained upon the slide by the inturned or inflected portions m^{12} of the slide. In moving rearwardly, the slide m^2 is stopped in position beneath the magazine by the stop m^{17}, and dwells a moment (the spring m^{15} of the link m^5 yielding), and the lowermost head or end in the stack drops into the slide, resting upon the ledge m^{11}. On the forward movement of the slide m^2, the head or end resting upon the ledge m^{11} is slid from beneath the stack, the stack in the meantime being supported by the upper face of the slide m^2. In case of a jam in the can-head feeding mechanism, the shear pin m^{21} breaks and allows the crank disk m^6 to move independently of the other parts of the can-head feeding mechanism.

After the can-head or end has been seamed upon the can body, the ejecting mechanism N comes into action to eject the can. The orbital movement of the finger n^7 brings it into contact with the can body, and causes it to push the can body from between the guides I. The finger n^7 then moves back and around into position to engage and push another can from the pad. In the case of a jam of a can upon the pad, the spring n^8 allows the finger n^7 to yield, thus preventing the jam from interfering with the motion of the collar n and eccentric n^1.

The inventive ideas may receive other mechanical expressions than those herein specifically illustrated and described.

What is claimed is:

1. In a machine for working on cans, a working mechanism, a plunger, approximating in dimensions the horizontal dimensions of a can-body, adapted to lift can-bodies into position to be acted on by said working mechanism, a feed table immediately adjacent said plunger, means for feeding cans from said table onto said plunger, and means for positioning can-bodies with respect to said working mechanism, said means comprising a fixed guide on said plunger adapted to engage a can-body on two opposite sides thereof as it is slid from said table onto said plunger, said guide permitting a can-body to pass thereon at one side and off at the other side.

2. In a machine for working on cans, a working mechanism, a plunger, approximating in dimensions the horizontal dimensions of a can-body, adapted to lift can-bodies into position to be acted on by said working mechanism, a feed table immediately adjacent said plunger, means for feeding cans from said table onto said plunger, and means for positioning can-bodies with respect to said working mechanism, said means comprising a guide on said plunger having approximately parallel edges between which the can-body is adapted to be moved, said guide permitting a can-body to pass thereon at one side and off at the other.

3. In a machine for working on cans, a working mechanism, a plunger, approximating in dimensions the horizontal dimensions of a can-body, adapted to lift can-bodies into position to be acted on by said working mechanism, a feed table immediately adjacent said plunger, means for feeding cans from said table onto said plunger, and means for positioning can-bodies with respect to said working mechanism, said means comprising a guide on said plunger having approximately parallel edges between which the can-body is adapted to be moved, said guide permitting a can-body to pass thereon at one side and off at the other, said edges being slightly converged so as to offer a slight resistance to the movement of can-bodies therein.

4. In a machine for working on cans, a working mechanism, a plunger, approximating in dimensions the horizontal dimensions of a can-body, adapted to lift can-bodies into position to be acted on by said working mechanism, a feed table immediately adjacent said plunger, means for feeding cans from said table onto said plunger, and means for positioning can-bodies with respect to said working mechanism, said means comprising a guide on said plunger having approximately parallel edges between which the can-body is adapted to be moved, said guide permitting a can-body to pass thereon at one one side and off at the other, and means adapted to move a can-body along said guide to a position in alinement with said working mechanism.

5. In a machine for working on cans, a working mechanism, a feed table, a plunger

adapted to lift can-bodies into position to be acted on by said working mechanism, and means for positioning can-bodies with respect to said working mechanism, said means comprising a guide on said plunger, means adapted to move a can-body along said guide to an extent determined with relation to the position of the can-body with respect to said working mechanism, and means for ejecting the cans from the guide.

6. In a machine for working on cans, a working mechanism, a guide for positioning said can-bodies with respect to said working mechanism, and a continuously rotatable finger adapted to move can-bodies along said guide to a position in alinement with said working mechanism, said guide having a lateral exit permitting the can-bodies to be moved away from the working position in the plane of the line of feed.

7. In a machine for working on cans, a working mechanism, a guide for positioning said can-bodies with respect to said working mechanism, and an adjustable continuously rotatable finger adapted to move can-bodies along said guide to a position in alinement with said working mechanism, said guide having a lateral exit permitting the can-bodies to be moved away from the working position in the plane of the line of feed.

8. In a machine for working on cans, a working mechanism, a guide for positioning said can-bodies with respect to said working mechanism, and a continuously rotatable finger adapted to move can-bodies along said guide to an extent determined with relation to the position of the can-body with respect to said working mechanism, said guide being adapted to permit the can bodies to be moved away from the working position in the plane of the line of feed, means for driving said finger, and a slip connection in said driving means adapted to permit movement of part of said driving-means when said finger is stopped by a jammed can.

9. In a machine for working on cans, means for moving or ejecting a can from a position in the machine, said means comprising a finger, and means for imparting an orbital movement to said finger, said means comprising a single eccentric and collar.

10. In a machine for working on cans, means for moving or ejecting a can from a position in the machine, said means comprising a finger and means for imparting an orbital movement to said finger, said means comprising an eccentric, and a collar actuated by said eccentric, carrying said finger.

11. In a machine for working on cans, means for moving or ejecting a can from a position in the machine, said means comprising a pivoted resiliently mounted finger, and means for imparting an orbital movement to said finger, said means comprising a single eccentric and collar, said finger adapted to give when a can is jammed in the path thereof.

12. In a machine for working on cans, means for moving or ejecting a can from a position in the machine, said means comprising a finger and means for imparting an orbital movement to said finger, said means comprising an eccentric, and a collar actuated by said eccentric, carrying said finger, said collar having a loose connection with a fixed part of the machine.

13. In a machine for working on cans, means for moving or ejecting a can from a position in the machine, said means comprising a finger and means for imparting an orbital movement to said finger, said means comprising an eccentric, and a collar actuated by said eccentric, carrying said finger, said collar having a tail loosely connected to a fixed part of the machine.

14. In a machine for working on cans, can-head feeding means comprising a slide having a support for the can-heads, said support having means for preventing displacement in any horizontal direction of said can-heads on the slide, said slide having an opening therethrough inwardly of the support, means for moving said slide to and from a receiving and a delivering position, said machine, in the delivery position of said slide, having a space into which the can-head on the slide may be lifted clear of the slide, said can-head being liftable from said slide, in the delivery position, by a thing operating through said slide, said slide having a construction permitting movement of the slide to its receiving position while the thing which lifts the can-head extends through said slide.

15. In a machine for working on cans, can-head feed means comprising a magazine, a slide having a support for the can-heads, said support having inflected or incurved portions adapted to prevent horizontal displacement of said can-heads on the slide, said slide having an opening between said inflected portions of sufficient width to admit a can-body, said slide being movable under said magazine, a lowermost can-head in said magazine being adapted to drop into said support on the slide and be separated from the stack of can-heads in the magazine as the slide moves from beneath the stack.

16. In a machine for working on cans, can-head feed means comprising a slide having an arcuate support for the can-heads, said support having inflected or incurved portions adapted to prevent horizontal displacement of said can-heads on the slide, and means for lifting a can-body to lift the can-head from the slide, said slide having an opening between the said inflected portions of sufficient width to admit a can body, said

support being adapted to retain the can-heads when not lifted therefrom by the can-body.

17. In a machine for working on cans, can-head feed means comprising a reciprocatory slide having an arcuate support for the can-heads, said support having inflected or incurved portions adapted to prevent horizontal displacement of said can-heads on the slide, and means for lifting a can-body to lift the can-head from the slide, said slide having an opening adjacent the arcuate support adapted to receive the can-body, said support being adapted to retain the can-heads when not lifted therefrom by the can-body.

18. In a machine for working on cans, can-head feeding means comprising a slide having a separate part on which is formed a support for the can-heads, said support having means for preventing displacement in any horizontal direction of said can-heads on the slide, said slide having an opening therethrough inwardly of the support, means for moving said slide to and from a receiving and a delivering position, said machine in the delivery position of said slide having a space into which the can-head on the slide may be lifted clear of the slide, said can-head being liftable from said slide, in the delivery position, by a thing operating through said slide, said slide having a construction permitting movement of the slide to its receiving position while the thing which lifts the can-head extends through said slide.

19. In a machine for working on cans, can-head feed means comprising a magazine, a slide having a support for the can-heads, said support having inflected or incurved portions adapted to prevent horizontal displacement of said can-heads on the slide, said slide having an opening between said inflected portions of sufficient width to admit a can-body, means for moving said slide under said magazine, a lowermost can-head in said magazine being adapted to drop into said support on the slide and be slid from beneath the stack of can-heads in the magazine, and means for producing a dwell of the slide under the magazine.

20. In a machine for working on cans, can-head feed means comprising a magazine, a slide having a support for the can-heads, means for reciprocating said slide under said magazine, a lowermost can-head in said magazine being adapted to drop into said support on the slide and be separated from the stack as the slide moves from beneath the stack, and means for producing a dwell of the slide under the magazine, said means including a stop limiting the movement of said slide and a resilient part in said reciprocating means.

21. In a machine for working on cans, can-head feed means comprising a magazine, a slide having a support for the can-heads, means for reciprocating said slide under said magazine, a lowermost can-head in said magazine being adapted to drop into said support on the slide and be slid from beneath the stack, and means for producing a dwell of the slide under the magazine, said means including an adjustable stop limiting the movement of said slide and a resilient part in said reciprocating means.

22. In a machine for working on cans, can-head feed means comprising a magazine, a slide having a support for the can-heads, means for reciprocating said slide under said magazine, a lowermost can-head in said magazine being adapted to drop into said support on the slide and be slid from beneath the stack, and means for producing a dwell of the slide under the magazine, said means including a stop limiting the movement of said slide, and a link having a resilient part therein adapted to give when the slide is stopped by said stop.

23. In a machine for working on cans, a vertical shaft, a working mechanism, a pad or plunger operated by said vertical shaft to lift cans to be operated on by said working mechanism, and a finger for pushing cans off of said pad after being acted on by the working mechanism, and an eccentric on said vertical shaft operating said finger.

24. In a machine for working on cans, a vertical shaft, a working mechanism, a pad or plunger operated by said vertical shaft to lift cans to be operated on by said working mechanism, said pad having a guide thereon for positioning the cans with relation to the working mechanism, and a finger for pushing cans off said pad after being acted on by the working mechanism, and an eccentric on said vertical shaft operating said finger.

25. In a machine for working on cans, a vertical shaft, a working mechanism, a pad or plunger operated by said vertical shaft to lift cans to be operated on by said working mechanism, a finger for pushing cans off of said pad after being acted on by the working mechanism, an eccentric on said vertical shaft operating said finger, and a can-head feeding mechanism having a slide adapted to bring can-heads to a position over said pad, said slide having an opening therein through which a can-body on the pad can pass, said pad being adapted to lift a can-body to remove a can-head from said slide.

26. In a machine for working on cans, a vertical shaft, a working mechanism, a pad or plunger operated by said vertical shaft to lift cans to be operated on by said working mechanism, a finger for pushing cans off of said pad after being acted on by the working mechanism, an eccentric on said

vertical shaft operating said finger, and a can-head feeding mechanism having a slide adapted to bring can heads to a position over said pad, said slide having an opening therein through which a can-body on the pad can pass, said pad being adapted to lift a can-body to remove a can-head from said slide, said slide having inflected or incurved portions adapted to retain the can-head therein when not removed by a can-body.

27. In a machine for working on cans, can-head feed means comprising a reciprocatory slide having a support for the can-heads, means for retaining can-heads on said slide until removed therefrom, and means for lifting can-bodies to lift can-heads off of said support.

28. In a machine for working on cans, can-head feed means comprising a reciprocatory slide having a support for the can-heads, said support having inflected or incurved portions adapted to prevent horizontal displacement of said can-heads, and means for lifting can-bodies to lift can-heads off of said support.

29. In a machine for working on cans, can-head feed means comprising a slide having an opening large enough to permit vertical passage of a flanged can-body, said slide having a support for the can-heads bordering said opening, said support having means adapted to prevent horizontal displacement of said can-heads on the slide, means for moving said slide to and from a receiving and a delivering position, said slide-moving means imparting relative horizontal movement between the end and slide when the end is lifted, said slide having an opening therein permitting said horizontal movement while the can is lifted.

30. In a machine for working on cans, can-head feed means comprising a reciprocatory slide, having a support for the can-heads, said support having inflected or incurved portions adapted to prevent horizontal displacement of said can-heads on the slide, said support having an opening between the ends of the incurved portions sufficiently wide to admit of the passage of a can-body.

31. In a machine for working on cans, can-head feed means comprising a slide having a support for can-heads, said support having means adapted to prevent horizontal displacement of said can-heads on the slide, said support having an opening sufficiently wide to admit of the lateral passage of a can-body, and of sufficient diameter to permit of vertical passage of a flanged can-body.

32. In a machine of the character described, a slide having a support for can-heads and means for preventing displacement in any horizontal direction of said can-heads from said support, and means for imparting a continuously reciprocating non-intermittent movement to said slide.

33. In a machine for working on cans, a working mechanism, a plunger, approximating in dimensions the horizontal dimensions of a can-body, adapted to lift can-bodies into position to be acted on by said working mechanism, a feed table immediately adjacent said plunger, means for feeding cans from said table onto said plunger, and means for positioning can-bodies with respect to said working mechanism, said means comprising a guide on said plunger adapted to engage a can-body on two opposite sides thereof as it is slid from said table onto said plunger, said guide permitting a can-body to pass thereon at one side and off at the other side.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

PETER KRUSE.

Witnesses:
AUGUST LOKAN,
FRÉDK. C. FLADD.