I. F. WARME.

CAN CLOSING MACHINE.

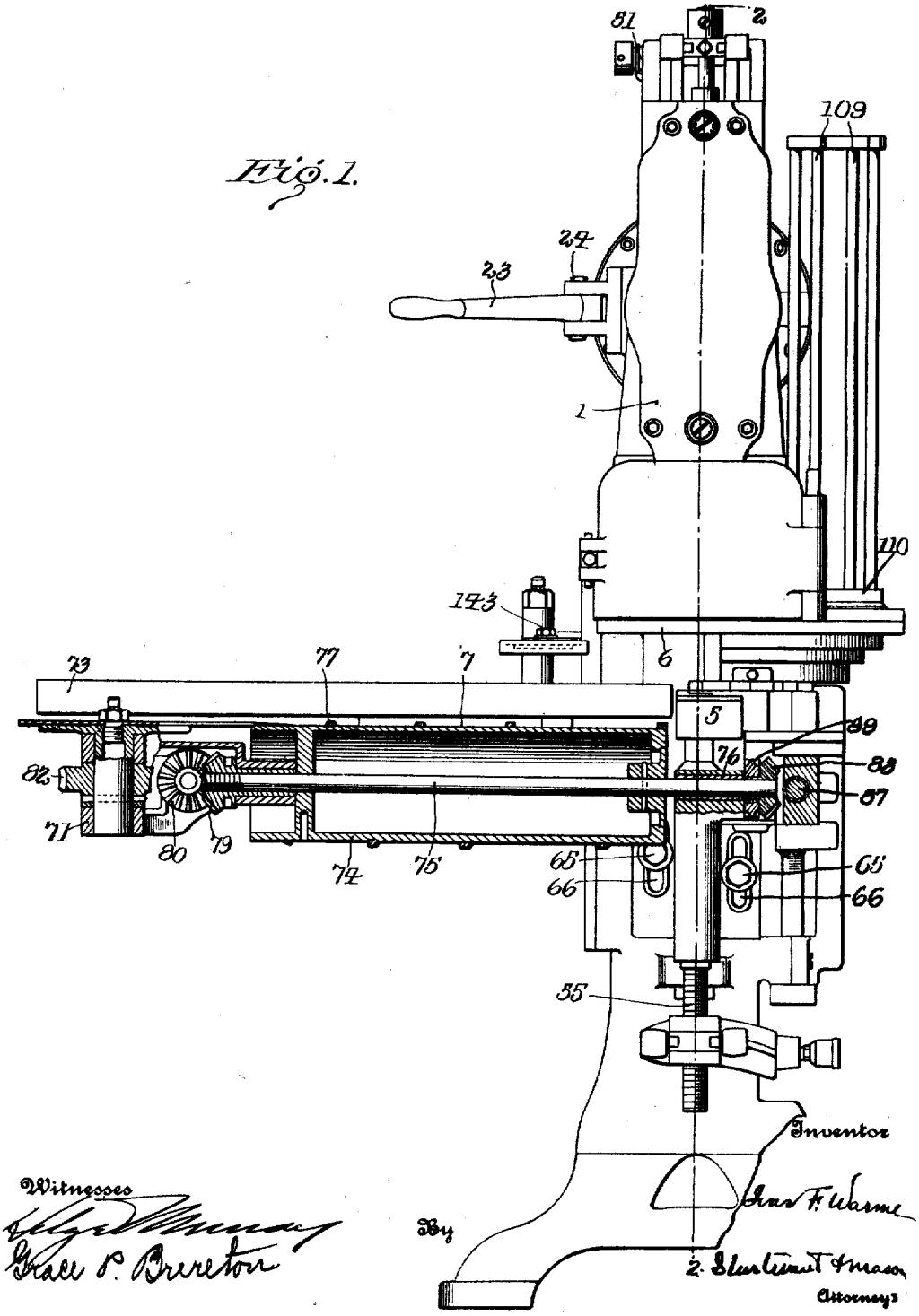
APPLICATION FILED AUG. 18, 1915.

1,307,888.

Patented June 24, 1919.

10 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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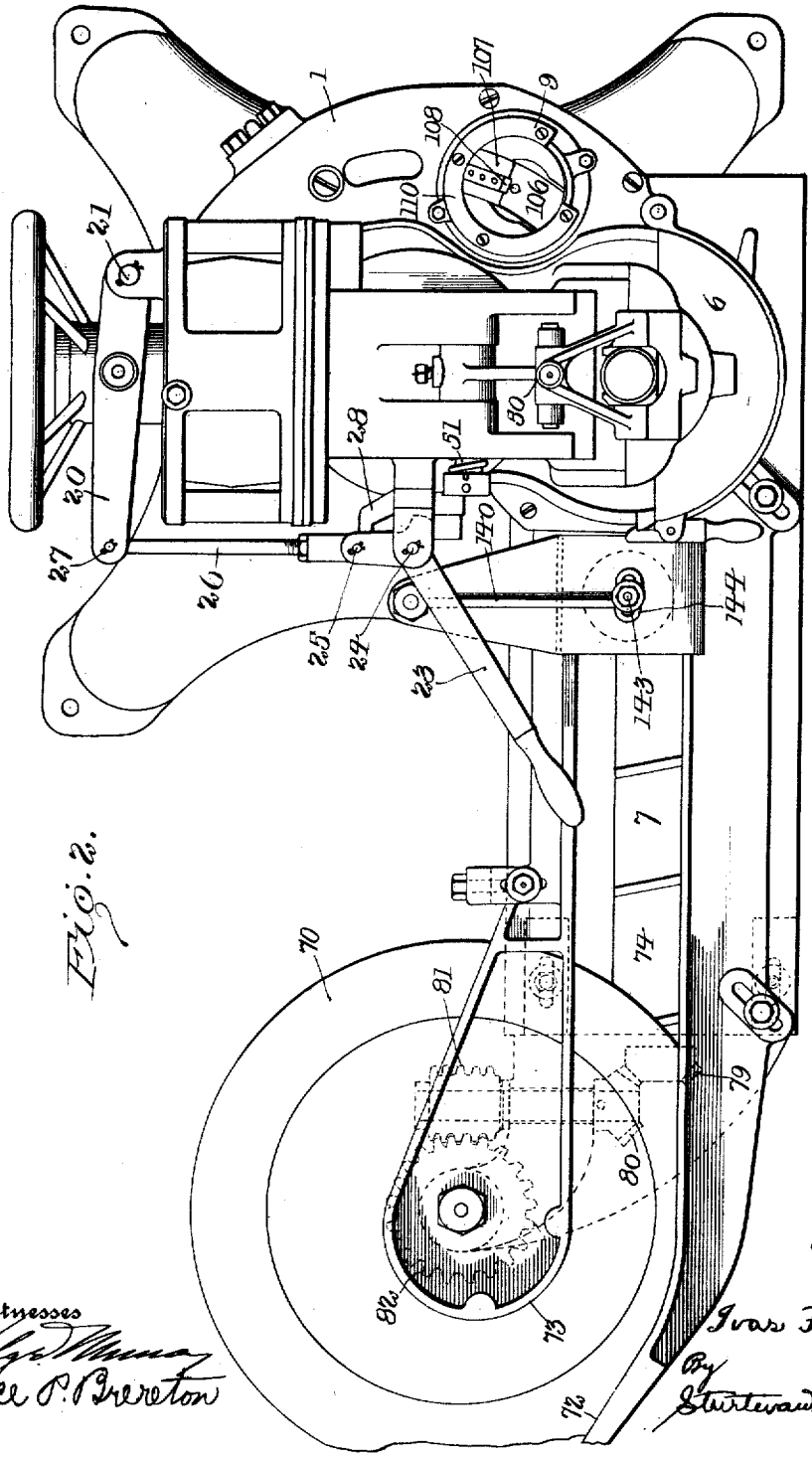


Fig. 2.

Witnesses

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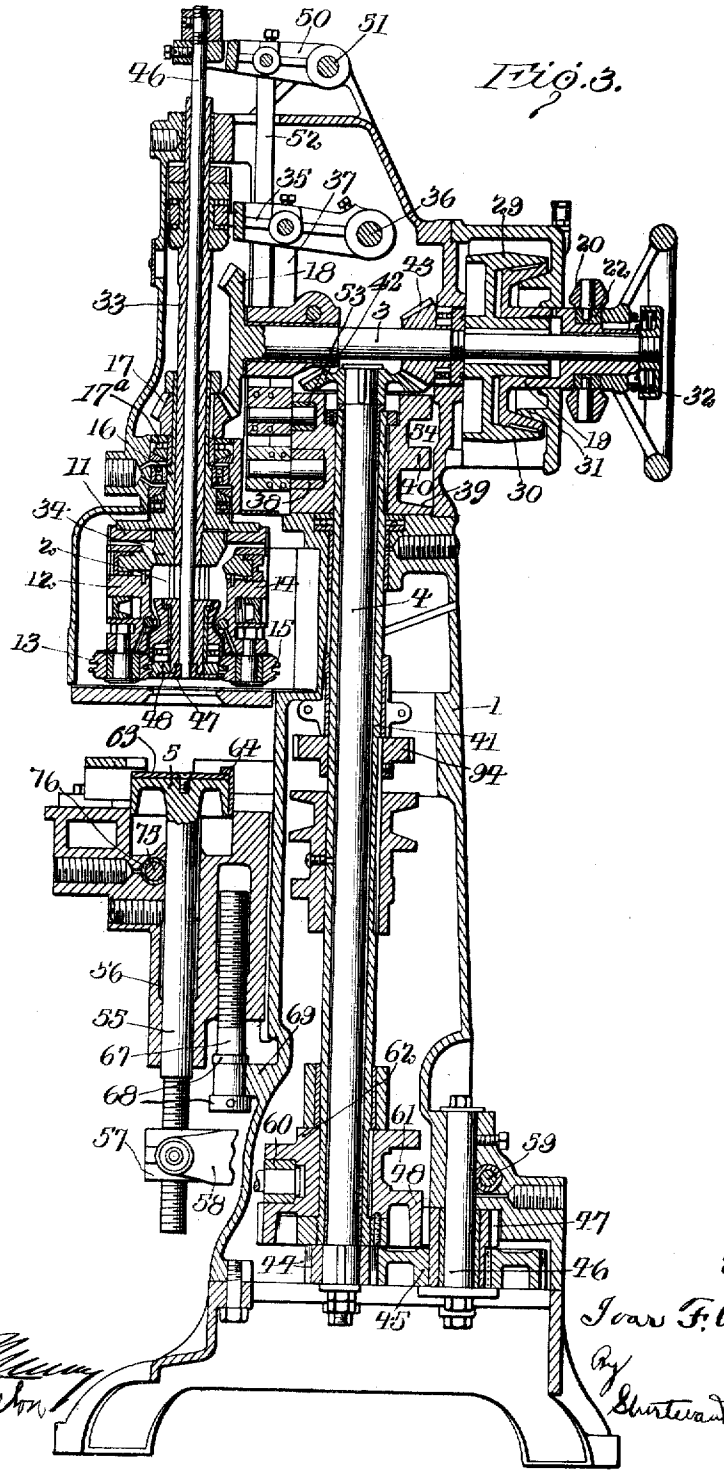
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10 SHEETS—SHEET 3.

Fig. 3.



Witnesses

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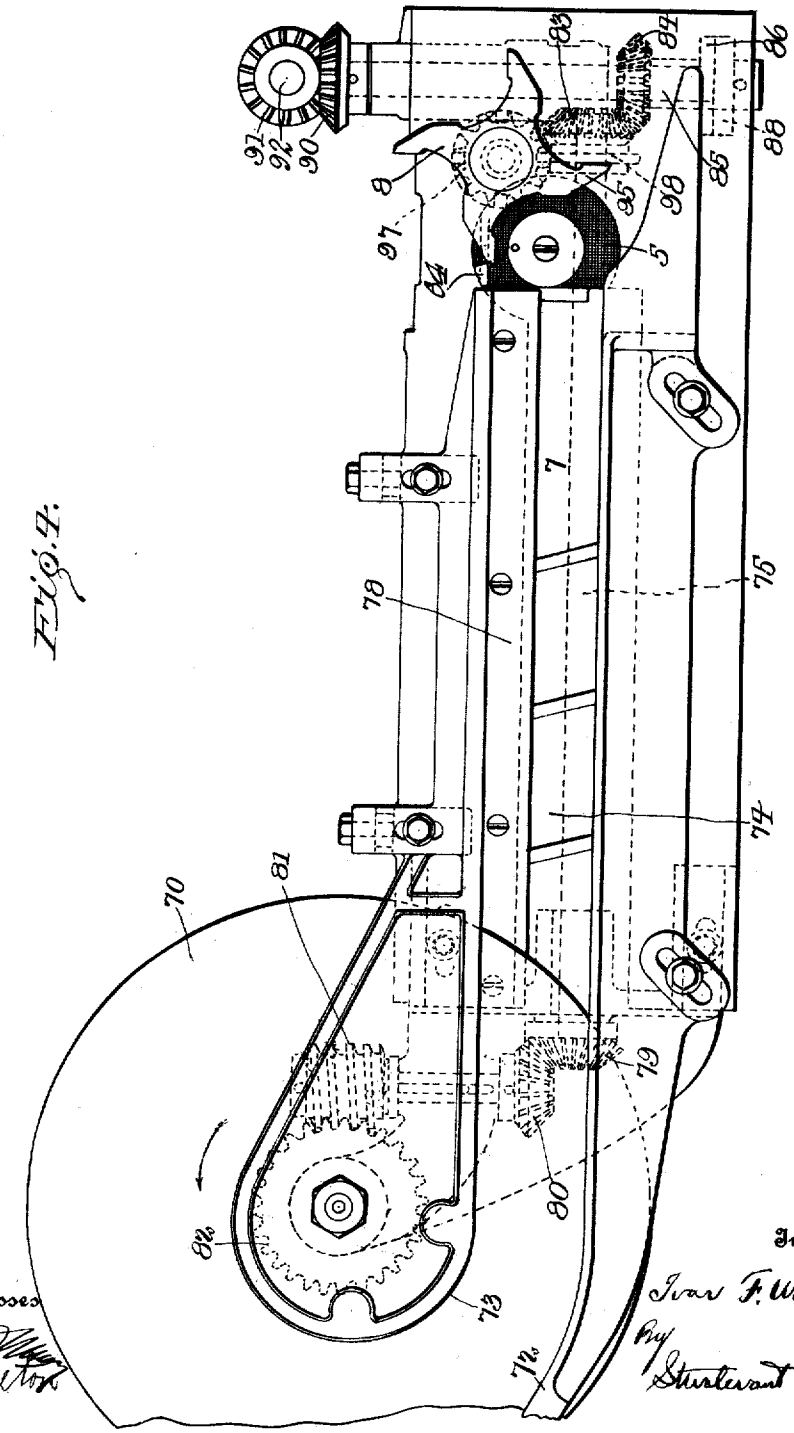


Fig. 4.

Witnesses

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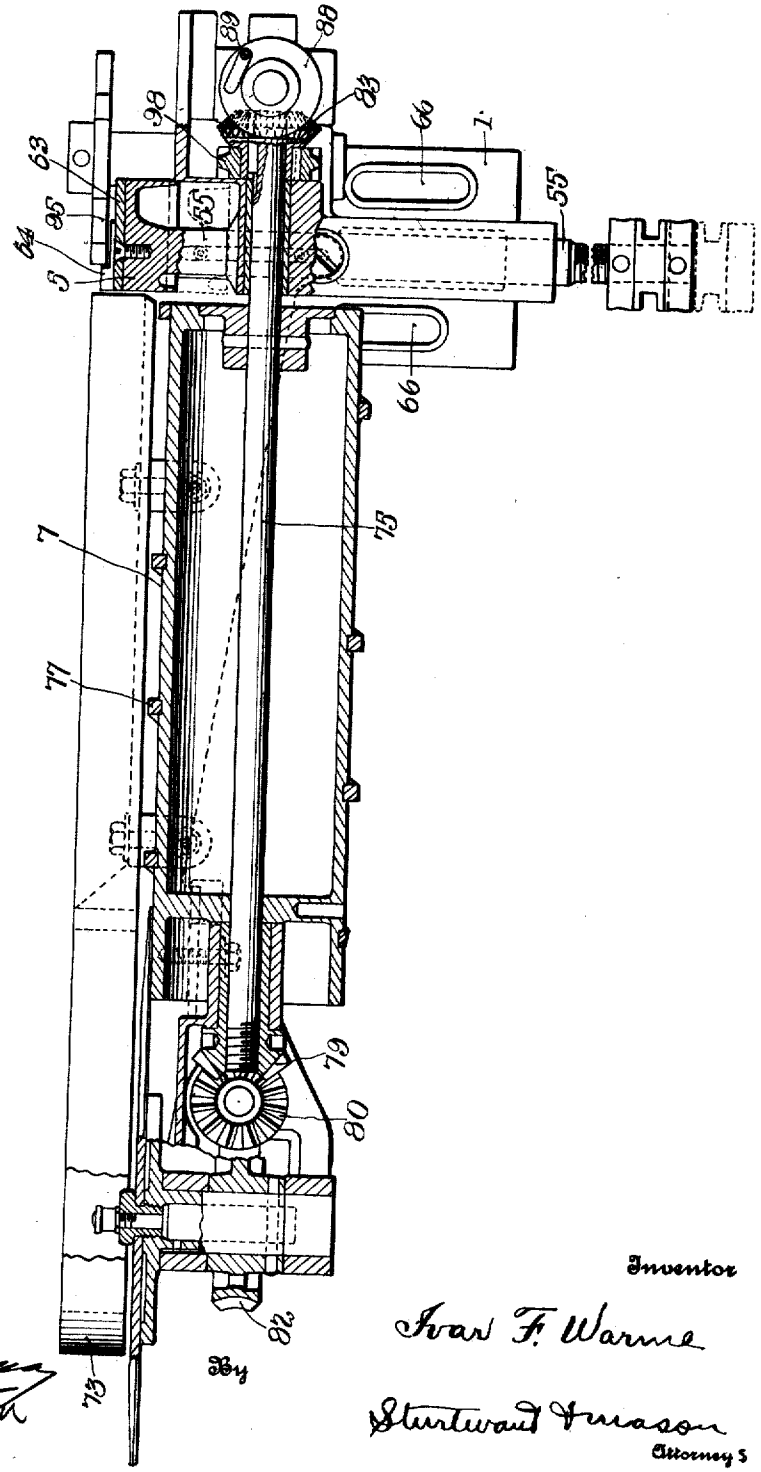


Fig. 5.

Witnesses

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10 SHEETS—SHEET 6.

Fig. 6.

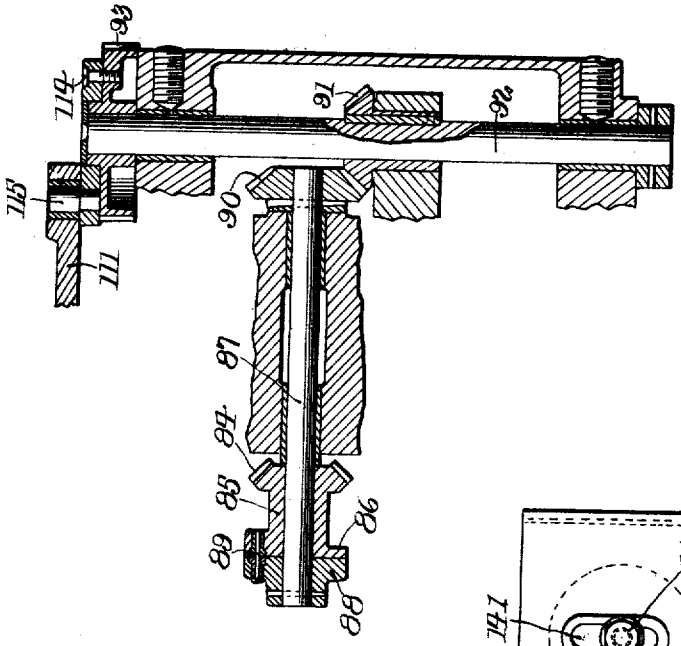
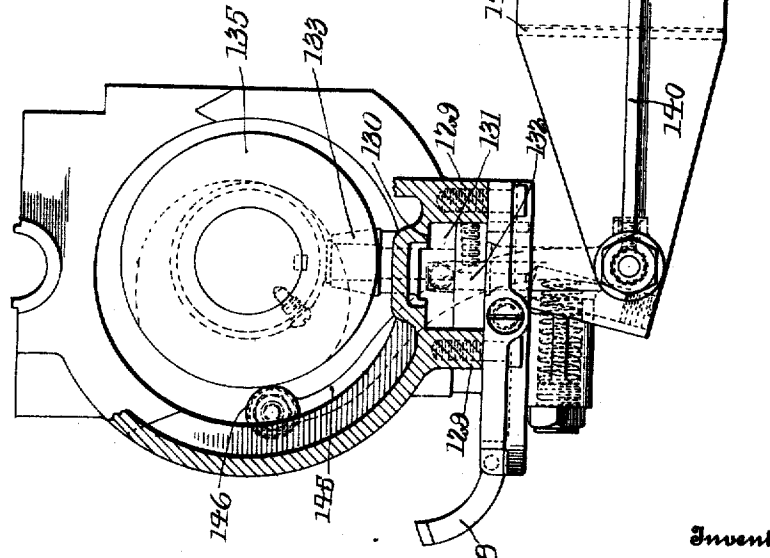


Fig. 13.



Witnesses

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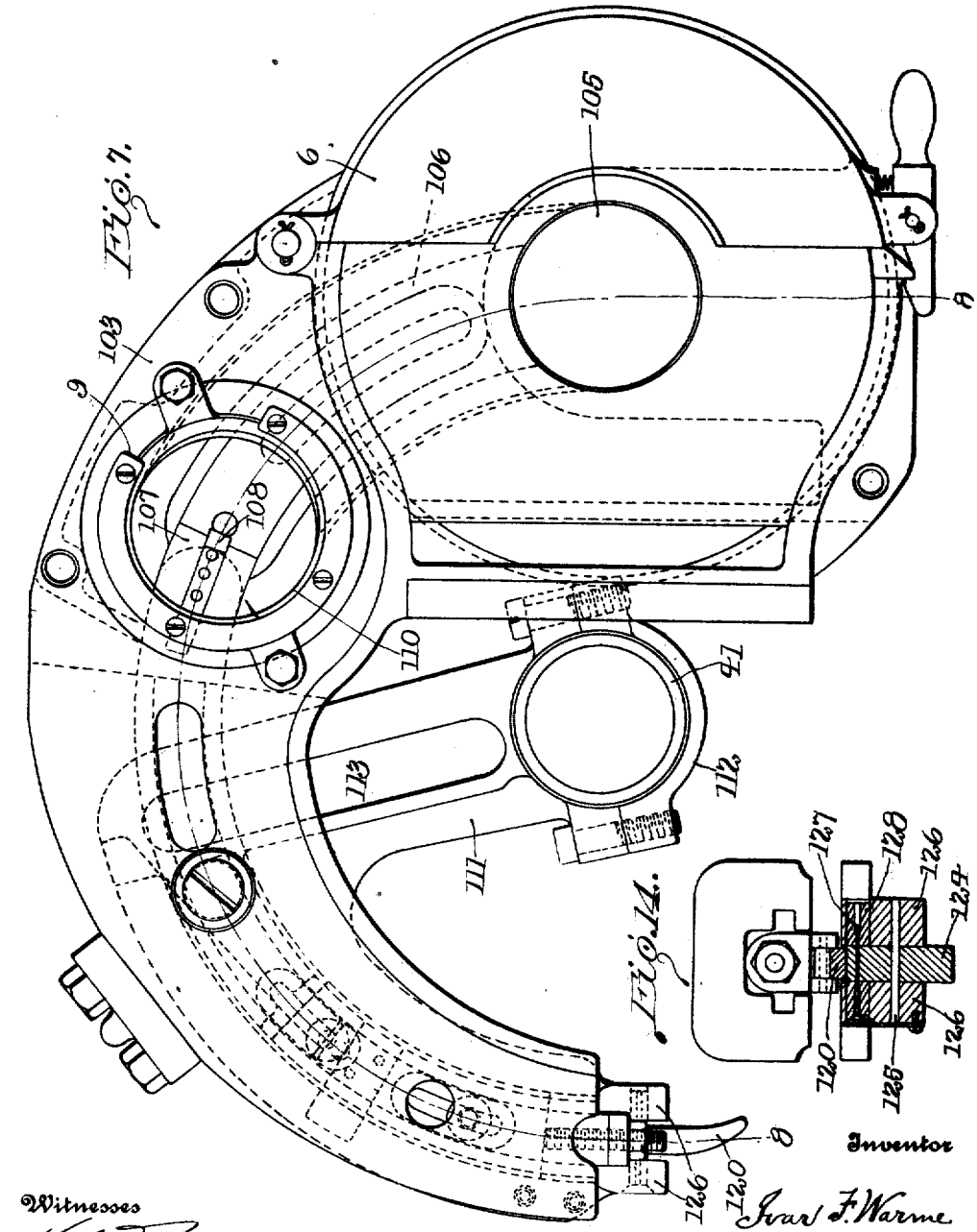
CAN CLOSING MACHINE.

APPLICATION FILED AUG. 18, 1915.

1,307,888.

Patented June 24, 1919.

10 SHEETS—SHEET 7.



Witnesses

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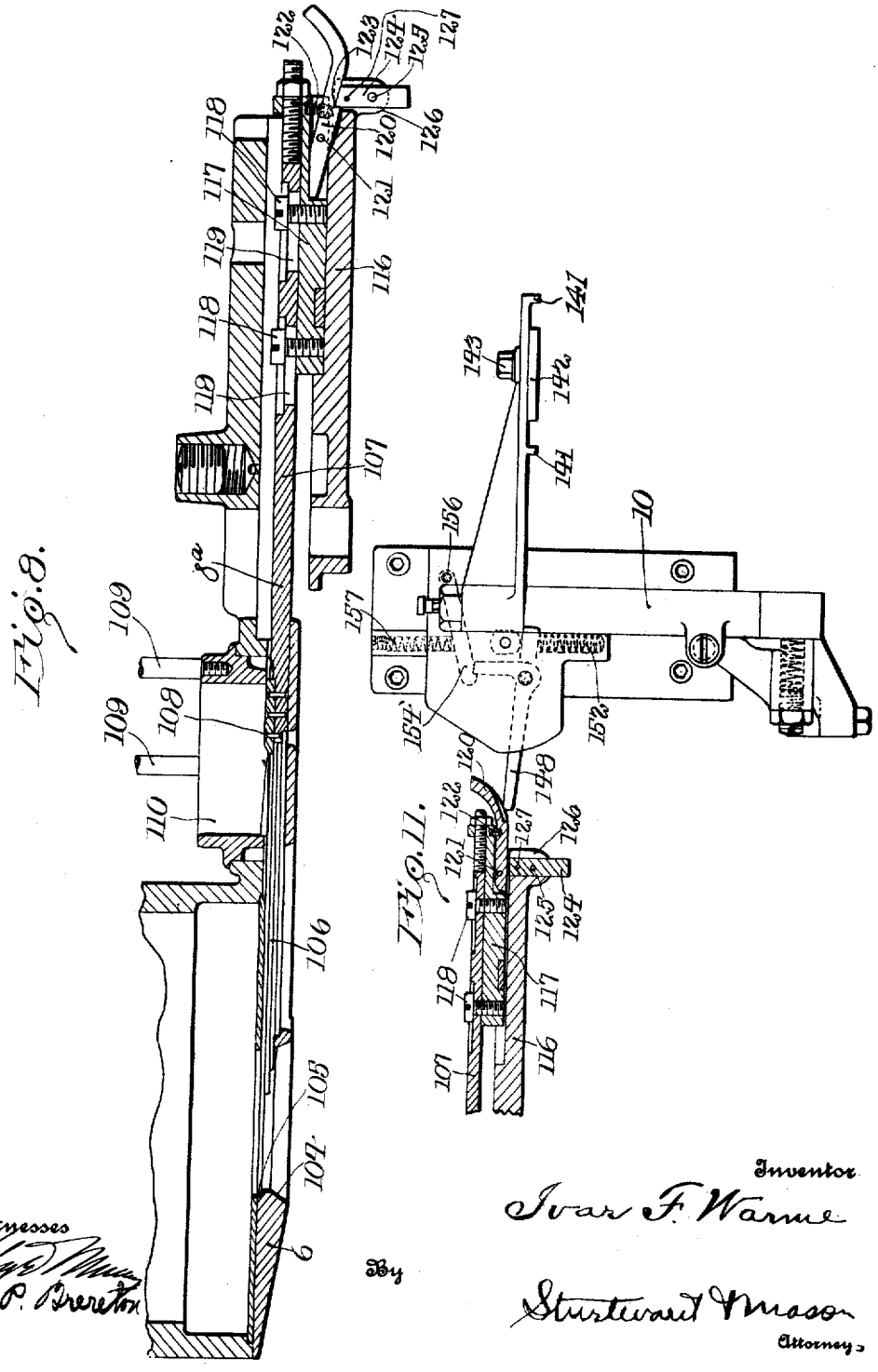


Fig. 8.

Fig. 11.

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CAN CLOSING MACHINE.

APPLICATION FILED AUG. 18, 1915.

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10 SHEETS—SHEET 9.

Fig. 10.

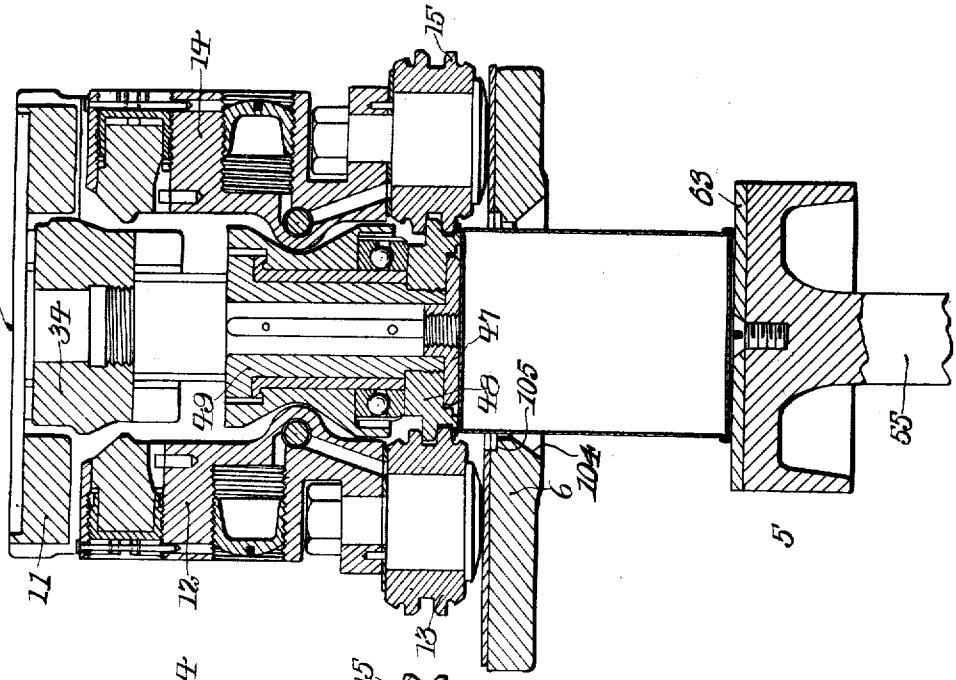
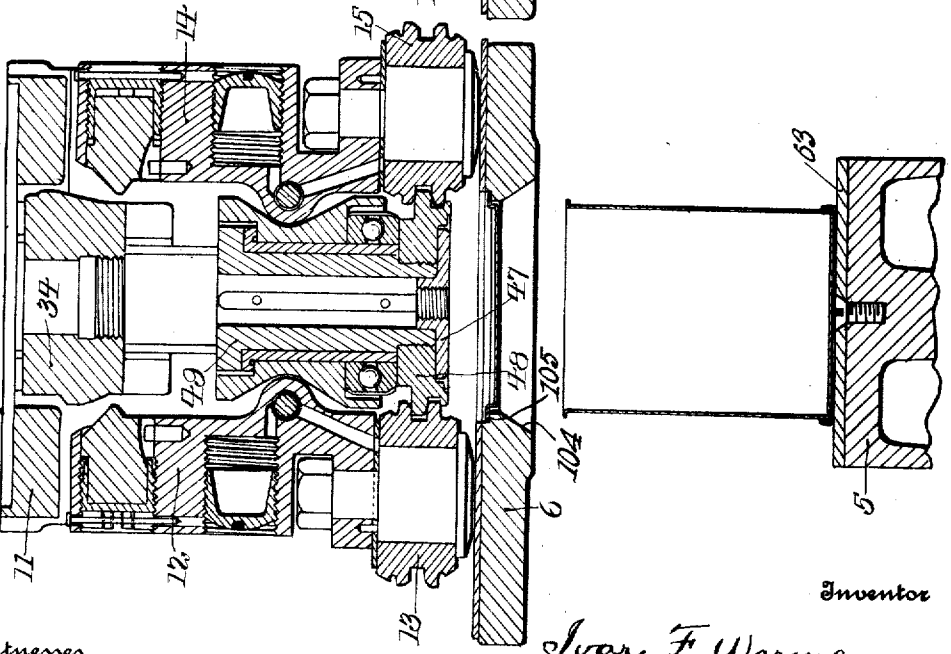


Fig. 9.



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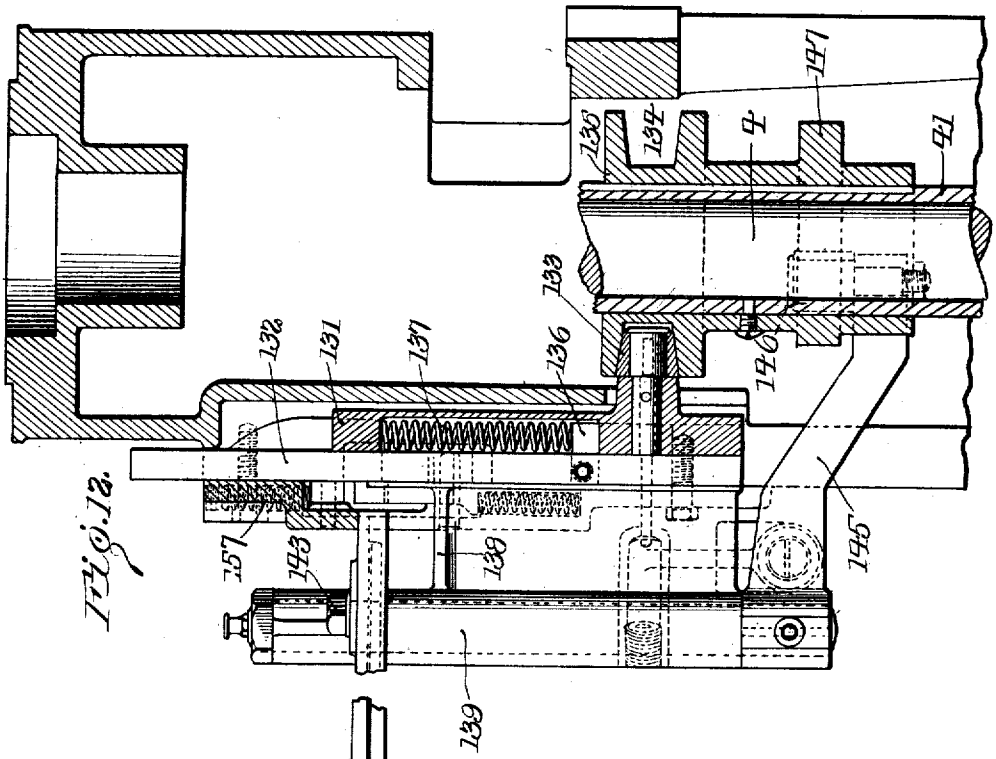


Fig. 12.

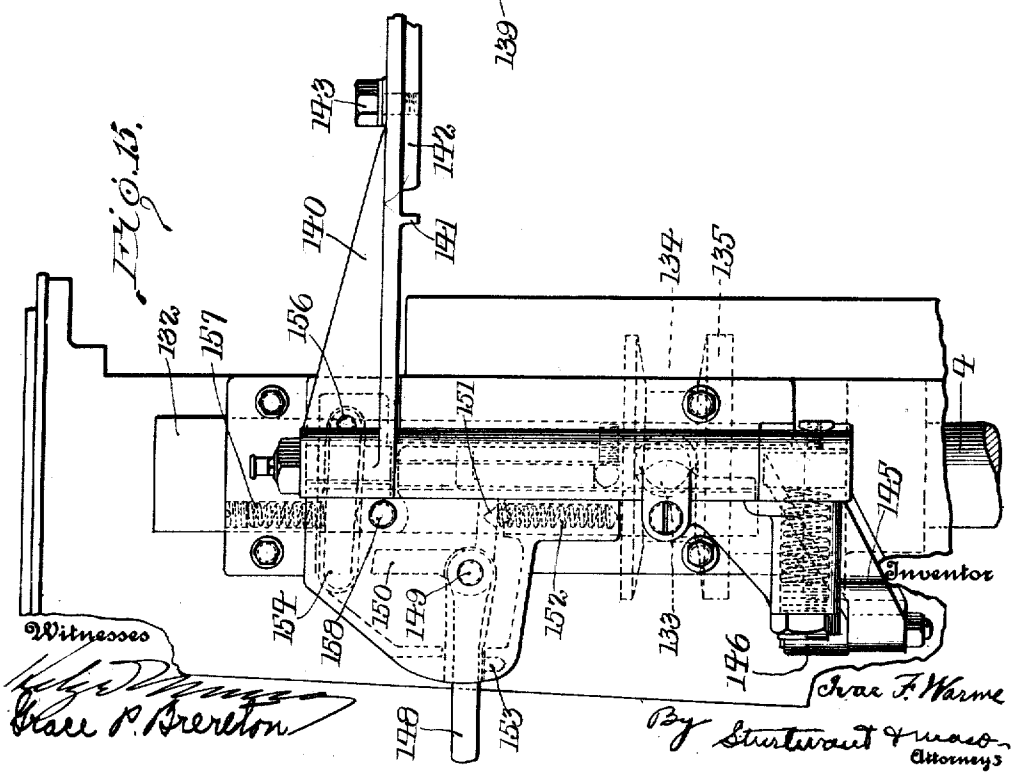


Fig. 13.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

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CAN-CLOSING MACHINE.

1,307,888. Specification of Letters Patent. Patented June 24, 1919.

Application filed August 18, 1915. Serial No. 46,133.

To all whom it may concern:

Be it known that I, IVAR F. WARME, a citizen of the United States, residing at Syracuse, in the county of Onondaga, State of New York, have invented certain new and useful Improvements in Can-Closing Machines, of which the following is a description, reference being had to the accompanying drawing and to the figures of reference marked thereon.

The invention relates to new and useful improvements in can closing machines, and more particularly to a machine for closing a filled can.

An object of the invention is to provide a can closing machine of the above character with a seaming head for connecting the end to the body of the can, which seaming head is positively rotated, and wherein the actuating parts of the seaming head—that is, the cams for the seaming rolls and the stripper rod for stripping the can from the seaming head are also positively moved up and down by cams which are operated from the same shaft which rotates the seaming head, but at a slower speed than the shaft.

A further object of the invention is to provide a closing machine of the above character, with means for supporting the filled can and for raising the same into engagement with the seaming head, which supporting means is raised and lowered by a cam on the shaft which actuates the parts of the seaming head.

A still further object of the invention is to provide means for placing a can end on a support underneath the seaming head, which support is also provided with a tapered rounding up and centering ring for the can body, which can end placing means is constructed so as to move concentrically about the axis of the seaming machine conveying a can end from the stack to the support underneath the seaming head.

A further object of the invention is to provide devices coöperating with the can end feeding means, which devices include a member for engaging a can as it is fed to the seaming machine and travels with the can while in engagement therewith.

A still further object of the invention is to provide a can end feed controlling means, wherein a member is brought into engagement with the upper end of the can and caused to travel therewith, which member is moved downwardly into engagement with the can by yielding means.

A still further object of the invention is to provide means for removing the closed cans from the support underneath the seaming head, which includes a rotating member having spaced arms for engaging the can and wherein said rotating member is positively but intermittently actuated by gears.

These and other objects will in part be obvious and will in part be hereinafter more fully disclosed.

In the drawings which show by way of illustration one embodiment of the invention,—

Figure 1 is a view partly in section and partly in front elevation, showing a closing machine embodying my invention;

Fig. 2 is a top plan view of the machine;

Fig. 3 is a sectional view on the line 2—2 of Fig. 1;

Fig. 4 is a plan view, showing the conveyer, the support for the can bodies and the means for stripping the closed cans from the support;

Fig. 5 is a view partly in side elevation and partly in section of the same;

Fig. 6 is a detail showing the operating shaft for driving the conveyer and operating the stripper and also for operating the can end feed;

Fig. 7 is a plan view of the stack holder, the support underneath the seaming head, and the means for feeding the can end from the stack holder to said support;

Fig. 8 is a sectional view on the line 8—8 of Fig. 7;

Fig. 9 is a sectional view of the seaming head, showing the centering ring underneath the same for supporting the can end and also the support for the can body, said support being in its lower position;

Fig. 10 is a similar view, showing the support raised;

Fig. 11 is a detail partly in section and partly in side elevation, showing a development of the can end feed and the means for disconnecting the same from its operating mechanism;

Fig. 12 is a view partly in section and partly in front elevation, showing the op-

erating mechanism for the can end feed controlling device;

Fig. 13 is a view partly in section and partly in plan of the same.

Fig. 14 is a detail in section showing the mounting for the plate which coöperates with the latch on the can end feed;

Fig. 15 is an enlarged view in side elevation of the can end controlling mechanism.

General structure.

My improved closing machine consists generally of a vertical standard or frame work 1 for supporting all the operating parts of the machine. Mounted to rotate about a vertical axis on this frame work is a seaming head 2. The seaming head 2 is rotated by a main operating shaft 3. This main operating shaft is geared to a vertical shaft 4 which actuates the operating parts of the seaming head that is, the cams for controlling the seaming rolls and the stripper pad for stripping the closed cans from the seaming head. The can to be closed is placed on a support 5 and is raised by an upward movement of the support into operative engagement with the seaming head. Just directly beneath the seaming head is a supporting plate 6 for the can ends, so that as the can body is raised the end will be seated therein. The can bodies are placed on this support 5 by a rotating drum conveyer 7 and they are stripped from the support after the can is closed by a rotating stripper 8. The drum and the rotating stripper are both actuated from a horizontal shaft which in turn is actuated from an auxiliary vertical shaft geared to the main vertical shaft 4.

The can ends are placed in a stack holder 9 and are fed on to the support 6 by a reciprocating pusher 8^a, which in turn is actuated from the auxiliary vertical shaft above referred to. This pusher is capable of being disconnected from its reciprocating means and the connection is controlled by a no-can no-end controlling mechanism 10, which is positively actuated from the main shaft of the machine and is adapted to engage a can as it is fed underneath the seaming head and travel therewith while in engagement with the can.

Seaming head.

Referring more in detail to the drawings, the seaming head 2 consists of a supporting head 11, on which is pivoted a lever 12 carrying a seaming roll 13. A second lever 14 is also pivoted on this head and carries a seaming roll 15. The supporting head 11 is fixed to a sleeve 16 which is mounted to rotate in a suitable bearing 17^a carried by the main frame. This bearing is provided with a suitable roller end thrust bearing and also a suitable roller lateral thrust bearing. Fixed to the upper end of the sleeve 16 is a bevel gear 17 which meshes with the bevel gear 18 on the end of the main shaft 3. This main shaft is mounted in suitable bearings in the supporting frame and on the outer end of the shaft is a cone friction pulley 19. This friction pulley may be slid endwise on the shaft by a yoke 20 which is pivoted at 24 to the frame and carries suitable rollers 22 running in a groove in the hub of the friction pulley. A hand lever 23 is pivoted at 24 to the frame of the machine and this hand lever is pivoted at 25 to a link 26, which link at its other end is connected at 27 to the yoke 20. The portion of the hand lever extending beyond the pivot 24 is adapted to be moved into alinement with the link 26. The pivotal connection between the lever and the link moves slightly by the dead center, so that these parts will be held in this position. A stop 28 coöperating with the lever 23 serves as an abutment for holding the parts as stated.

Also mounted on the shaft 3 and turning free thereon is a belt wheel 29 which has a cone friction surface 30 adapted to be engaged by the friction surface on the pulley 19. When the pulley 19, which may slide endwise on the shaft, is moved to the left, as viewed in Fig. 3, these parts are brought into engagement and the main shaft will be operated from the belt wheel. When, however, the pulley 19 is moved to the right, as viewed in this figure, then it is brought into engagement with a tapered flange 31, which operates as a brake to stop the machine. A spring 32 normally operates to force the cone pulley 19 into engagement with the belt wheel. When the lever 23 is thrown into the position shown in Fig. 2 the cone pulley is moved out of engagement with the belt pulley, compressing the spring 32, and into engagement with the braking flange 31. It will thus be seen that through this controlling mechanism the spring will hold the parts in driving connection.

Extending through the sleeve 16 is a second sleeve 33. This sleeve 33 carries the cam 34 which operates the seaming levers 12 and 14. The construction of this operating cam and the manner of actuating the seaming levers thereby, so that the first operation roll performs its function before the second operation roll is brought into contact with the can end is well known in the art and further description thereof is not thought necessary. The sleeve 33 carrying the operating cam is moved up and down by a lever 35 which is pivoted at 36. Said lever is so connected to the sleeve that said sleeve may rotate freely and this sleeve 33 is connected to the outer sleeve 16, so as to rotate with the seaming head and thus preserve the relation between the operating cams for the seaming levers and said levers. The lever

35 is raised and lowered by a reciprocating cross-head 37, which is guided by a bearing in the frame and has a roller 38 which runs in a cam groove 39 formed in the cam drum 40. This cam drum 40 is keyed to a sleeve 41 which surrounds the vertical shaft 4. The vertical shaft 4 carries a bevel gear 42 at its upper end which meshes with a bevel gear 43 keyed on the main shaft 3. At the lower end of the shaft 4, there is a gear 44 which meshes with a gear 45 on a counter-shaft 46. This counter-shaft 46 carries a gear 47 which meshes with a gear 48 fixed to the sleeve 41. The purpose of this train of gears between the shaft 4 and the sleeve 41 is to reduce the rotation, so that the sleeve 41 will rotate very much slower than the main shaft 3. It is desired that the seaming head shall rotate at a very much greater speed than the controlling shaft for the cams which operate the seaming rolls as the seaming head makes several rotations before the seaming levers have been shifted to complete the operation of seaming. This cam groove 39 which operates the sleeve 33 through the lever 35 is constructed so as to move the sleeve positively. The cross-head 37 reciprocates in a line substantially parallel with the axis of the sleeve, so that the movements imparted by the cam are positively and directly transmitted to the sleeve.

Extending through the sleeve 33 is a rod 46. This rod carries a stripper pad 47 at its lower end which is located in a recess formed in a chuck 48. The chuck 48 is mounted on the supporting head for the seaming rolls, so that the seaming head may rotate freely above the chuck and the chuck is held from rotating by being splined to this rod 46. The chuck is held from endwise movement by being attached to a sleeve 49 which has a flange at its upper end for supporting the chuck. A roller thrust bearing is located between the supporting head and the chuck. The rod 46 is raised and lowered by a lever 50 which is pivoted at 51 to a suitable bracket carried by the main frame. Said lever is raised and lowered by a cross-head 52 which carries a roller 53 cooperating with a cam groove 54 in the cam drum 40.

From the above description, it will be apparent that I have provided a seaming head wherein the seaming rolls rotate in a fixed plane—that is, have no up and down movement except, of course, that each seaming roll swings in the arc of a circle when moving toward and from the cans. Said seaming rolls are positively driven from a direct gear connection with the main shaft. The cams for controlling the levers which carry the seaming rolls and also the ejecting pad are positively raised and lowered by cams carried by a vertically rotating shaft which is driven from the main shaft at a different speed than the main shaft. The operating parts, therefore, for the controlling cams referred to and the ejecting pad are comparatively few in number, simple in construction and efficient in action owing to the positive movements thereof and the substantially direct lines of thrust.

Can body support.

The filled cans to be closed are placed one at a time on the support 5, which, as shown in the drawings, consists of a supporting head or disk mounted on a stem 55 which may be moved up and down in a suitable bearing 56. This stem at its lower end has a threaded connection with a collar 57 and the collar 57 is connected to a lever 58 pivoted at 59 to the frame of the machine, and this lever is moved up and down by a roller 60 running in a cam groove 61 in a cam drum 62, which is keyed to the sleeve 41. This cam drum 62 travels in unison with the cam drum 40 which moves the seaming rolls into contact with the can and also controls the ejecting pad and the cams are so constructed and timed that the can body is raised by the lifting of the support 5, so as to engage the seaming head when the rolls are separated, after which the cam groove 39 operates first one seaming roll and then the other and when the end is finally double seamed to the can body, then the support 5 is lowered into position for stripping the closed can therefrom.

The stem 55 which carries the can body support 5 is threaded into the collar 57, as above noted, and this permits the support to be adjusted relative to its operating lever 58 for raising and lowering the same. Mounted on the upper face of the support 5 is a hardened plate 63 and also attached to this support 5 is a guide 64. The bearing 56 for the support is carried by a supporting plate which is adjustably mounted on the frame of the machine. This supporting plate is bolted to the frame by suitable bolts 65 which pass through slots 66 in the vertical plate carrying the bearing. A threaded shaft 67 engages the support and this shaft has spaced flanges 68 which engage a rib 69 in the frame. This engagement of the flanges with the ribs permits the shaft to be rotated but holds the same from endwise movement relative to the frame. By loosening the bolts 65 and turning the shaft 67 the supporting plate may be raised or lowered. This raising or lowering of the supporting plate does not, of course, change the reciprocating position of the support 5 for the can body. This can only be changed by shifting the collar 57 on the lower threaded end of the stem carrying the support 5. The purpose of this adjustment of the supporting bearing will be more apparent in

connection with the description of the conveyer which places the filled can on the support 5.

Conveyer.

The means for conveying the cans to the closing machine is shown in Figs. 1, 2, 4 and 5. The can bodies are placed on a rotating disk 70, which is mounted in a bracket 71 carried by the supporting plate for the bearing 56. As this disk rotates in the direction of the arrow in Fig. 4, the filled cans are carried one after another between the guides 72 and 73 on to a conveyer drum 74. This conveyer drum 74 is mounted on a shaft 75 which is journaled in the bracket 71 and in the bearing 56. Said bearing 56 is formed with a bushing 76 for said shaft, see Fig. 3. The drum 74 is provided with a spiral thread 77, and as the drum rotates this spiral thread will move the filled cans toward the closing machine. One side of the can rests on the drum, while the other side rests on a supporting plate 78. This supporting plate and the drum extend to the can body support 5 and one side of said support is cut away, as shown in Fig. 4, so as to permit the filled cans to be moved by the drum on to the support 5 without spilling the contents thereof.

In Fig. 5 of the drawings, I have shown the support 5 in its raised position in full lines and in dotted lines the lower position of the same. The guide rails 72 and 73 are adjustably supported, so that they may be shifted for varying sizes of cans. The shaft 75 carries a bevel gear 79 which meshes with a bevel gear 80 connected to a short cross-shaft, shown in dotted lines in Fig. 4, and this cross-shaft carries a worm gear 81, which meshes with a gear 82 on the hub of the disk 70, so that as the drum is rotated this disk 70 will be rotated and place the cans one after another on the drum and the rotation of the drum will convey the cans to the support 5. The shaft 75 at its other end is provided with a bevel gear 83 which in turn meshes with a bevel gear 84 attached to a sleeve 85, see Fig. 6. The sleeve 85 is formed with a projecting flange 86. This sleeve is mounted on a horizontal shaft 87, which in turn is mounted to rotate in a suitable bearing in the bracket carrying the shaft 75. Attached to the outer end of this shaft 87 is a disk 88 and this disk 88 is connected with the flange 86 by a breakable pin 89. This breakable pin 89 is adapted to be placed in an opening formed in hardened sleeves mounted respectively in the flange and in the disk. The purpose of this connecting pin is to permit the disk 88 to be disconnected from the flange 86 if the parts of the feeding mechanism should be clogged by a can body. Under such conditions, the connecting pin will be severed by these hardened sleeves. The shaft 87 at its inner end carries a bevel gear 90 which meshes with a bevel gear 91 splined to the shaft 92. The gear 91 is capable of being slid up and down on the shaft 92 when the support for the shaft 87 is adjusted vertically through the action of the threaded shaft 67, above described. This vertical shaft 92 is mounted in suitable bearings in the frame of the machine and carries a gear 93 at its upper end which meshes with a gear 94 which in turn is keyed to the sleeve 41, so that as the sleeve 41 rotates the gear 94 rotates the gear 93, which in turn operates the shaft 92 and the shaft 92 rotates the shaft 87 and this rotates the shaft 75 operating the feeding drum. It will be noted that all these operating parts for the drum may be adjusted vertically by releasing the bolts 65 and turning the threaded shaft 67. The purpose of this adjustment is to adapt the machine for operating upon cans of varying sizes.

Stripper.

The stripper 8 for removing the closed cans from the support 5 is in the form of a four-arm wheel. Each arm 95 projects radially from the hub of the wheel and is adapted to engage a filled can on the support 5 and when this wheel is rotated the filled can will be moved from the support into a suitable receiving chute. The stripper wheel 8 is intermittently operated by the following mechanism.

Said stripper wheel is secured to the upper end of a short shaft which is mounted in the same bracket which carries the conveyer. On this shaft is splined a gear 97 which meshes with a gear 98 keyed to the hub of the gear 83 which drives the shaft 75. The stripper wheel is located at a sufficient distance above the support 5 to permit its being raised and lowered for presenting the can to the closing machine, as clearly shown in Fig. 5.

Can end feed.

The can ends are placed in the stack holder 9, which is mounted in a suitable supporting bracket 103. This bracket is attached to the frame of the machine. Said bracket carries the supporting plate 6, which extends underneath the seaming head and said supporting plate is provided with a tapered opening 104, which centers the can body and rounds up the same when it is raised by the lifting of the support 5 through said opening. On the upper face of the plate is a seat 105 for the can end. The bracket 103 between the stack holder and the seat 105 is formed with a guiding recess 106 for the can ends. The can ends are taken one at a time from the stack and moved along this guiding recess on to the

supporting seat 105 by the pusher 8^a. The pusher 8^a consists of a reciprocating plate 107, see Fig. 8, which has a stripper blade 108 adapted to separate the lowermost can end from the stack and carries the same along the guiding recess 106 to its seat underneath the seaming head. This stack holder consists of a plurality of rods 109 which are carried by the stack holder ring 110, and the pusher plate 107 moves underneath the stack holder ring. Said pusher plate is operated by an oscillating arm 111. Said arm is carried by a supporting collar 112, which is mounted to oscillate freely on the sleeve 41, so that the axis of the arm is the centering line or axis of the seaming machine. This arm is provided with a radial groove 113. On the upper end of the shaft 92, I have fixed a disk 114 which carries a pin 115 having a roller which runs in this groove 113, see Fig. 6. The guiding recess for the can end and the pusher plate 107 all curve about the axis of the sleeve 41 or the pivotal axis of the arm 111. This arm 111 is also curved to conform to this path of travel of the pusher latch and the supporting bracket 103 is likewise curved. The curved portion of the arm 111 is indicated at 116 in Fig. 8. The pusher plate 107 has adjustably attached thereto a latch plate 117. Said latch plate is connected to the pusher plate by suitable bolts 118 which pass through slots 119 and are threaded into said latch. A latch 120 is pivoted at 121 to the latch plate. This latch is normally spring pressed in a downward direction by a spring 122. Said latch has a shoulder 123 which is adapted to be engaged by a plate 124 carried by the curved portion 116 of the arm 111. Said plate is pivoted at 125 between spaced lugs 126 at the outer end of the arm 116 and is held in fixed position relative to the arm by a breakable pin 127. Said pin is adapted to be inserted in suitable openings in hardened sleeves 128 carried by the lugs 126 and extends through an opening in the plate 124. Said plate is preferably of hardened metal. When the parts are positioned, as shown in Fig. 8, the latch is in engagement with the plate 124, and the reciprocating movements of the arm 111 will be imparted to the pusher plate 107, and for each oscillation of the arm 111 a can end will be taken from the stack and placed on the can end support underneath the seaming head. If, however, the latch 120 be raised, so as to be disengaged from the plate 124, then the reciprocations of the arm 111 will not impart any movement to the pusher plate 107. When the parts are locked, as shown in Fig. 8, and a cover becomes jammed, then the hardened plate 124, coöperating with the hardened sleeves, will shear the pin 127, thus releasing the plate 124, which will turn about its pivotal point 125.

No can no end mechanism.

The means for controlling the feeding of the can ends is shown in detail in Figs. 11, 12 and 13. The main frame of the machine has outwardly projecting ribs 129 forming a guiding recess 130, in which reciprocates a supporting bar formed of two sections 131 and 132. The section 131 carries a roller 133 which runs in a cam groove 134 in a cam disk 135 connected to the sleeve 41. The section 132 carries a pin 136 which projects into a recess in the section 131, and a spring 137 located in this recess normally holds the pin at the lower end thereof. The cam groove 134 operating upon the roller 133 reciprocates the sections 131 and 132, but this spring and pin connection between the sections permits said outer section to move outwardly relative to the inner section. Extending laterally from the outer section is a bracket 138 carrying a bearing sleeve 139. Pivotally mounted in this bearing sleeve is a short shaft carrying an outwardly projecting arm 140. This arm 140 at its outer end is provided with parallel ribs 141 and a disk shaped member 142 which is adjustably connected to the arm, so that the same may be shifted in a direction parallel with the ribs by a securing bolt 143. Said bolt passes through a slot 144 in the arm 140. At the lower end of the shaft carrying the arm 140 is a second arm 145, which carries a roller 146 adapted to engage a cam 147 mounted on the hub of the cam disk 135. This arm 140 is reciprocated up and down through the action of the cam 134 and is moved sidewise through the action of the cam 147. This arm is so positioned and the cams are so timed that the arm comes down over the top of a filled can on the conveying drum and, if a can is being fed along by the drum, said arm will engage the can between the ribs 141 and the disk 142 preferably rests on the top of the can. The arm 140 is moved sidewise at a proper speed, so that this plate resting on the top of the can will travel with the same along the conveyer. In other words, the arm 140 has in effect four motions—first, a downward movement until the plate engages the can body; then a lateral movement with the can body, thence an upward movement, and finally a backward movement to its normal position.

Mounted on the laterally projecting bracket formed integral with the rib 129 is a releasing pawl 148, and this releasing pawl is pivoted at 149 and has an upwardly projecting arm 150 and a laterally projecting arm 151. This laterally projecting arm 151 is normally forced upwardly by a spring 152 and this holds the outer end of the pawl

148 resting against a stop screw 153. Also mounted on this bracket is a holding pawl 154 which is pivoted at 156 and normally spring pressed downwardly by a spring 157. Projecting laterally from the bracket 138 and reciprocating with the same is a pin 158. This pin is adapted to engage the arm 151 when moved downwardly and to engage the locking pawl 154 when moved upwardly. The releasing pawl 148 is adapted to lie in the path of reciprocation of the latch 120, see Fig. 11.

When the sliding bars move downwardly through the action of the cam 134, if there is no can body on the conveyer, then the bracket arm 140 will move its full stroke, but, if there is a can on the conveyer, then said arm will engage the top of the can and will move no further although the reciprocating sliding section 131 will continue its downward movement. This is permitted by the spring and pin connection 136 and 137. The upward movement of the arm 140 and the bracket carrying the same causes the pin 158 to engage the locking pawl 154 and release the tripping pawl 148, so that the spring 152 will throw the same to the position shown in Fig. 15. A downward movement of the arm 140 and the bracket supporting the same carries the pin 158 downwardly. If this movement of the bracket is not limited by a filled can, then the pin 158 will strike the arm 151 and shift the upper end of the arm 150 of the releasing pawl, so that it will be engaged by the holding pawl 154. When this releasing pawl 148 is held by the locking pawl 154, the end of the pawl 148 will be engaged by the latch 120 and this will cause the latch to swing upwardly releasing the latch from the holding plate 124 and the pusher plate 107 will not be moved by the swinging of the arm which feeds the can ends. On the other hand, if the locking pawl 154 is released, then the spring 152 will throw the releasing pawl 148 to a position so that it will fail to lift the latch to release the same. It will be noted from above that the locking pawl will be operated to hold the releasing pawl 148, whenever the arm 140 makes a full stroke, so that the releasing pawl is swung to a point to be engaged by the locking pawl and whenever a can body limits the movement of this arm 140, then the locking pawl becomes ineffective for the reason that when the arm 150 is moved to the left by the spring the hook on the end of the locking pawl will not engage over the same. It will be apparent, therefore, that I have provided mechanism controlled by the can bodies fed along the conveyer drum for determining whether a can end is to be fed underneath the seaming head. If there is no can body, then there will be no can end fed, and when a can body is fed under the seaming head a can end will be also fed on to the support beneath the seaming head ready to receive the can body when it is lifted by the support 5.

Operation.

The operation of my device will be apparent from the detail description of the various parts given above. The filled cans are placed on the feeding-in disk 7 and are carried around and delivered one at a time to the conveyer 74 which feeds the same one at a time on to the support 5. A can end is taken from the stack by the sliding pusher and is moved underneath the seaming head on to the seat on the supporting plate 6. The support 5 is raised through the action of the cam groove 61 and the tapered opening in this supporting plate 6 rounds up the can body and centers the same, so that the can end will be seated therein. It will be understood that the ejecting pad moves downwardly so as to engage the can end and aids in seating the same in the can body, after which the ejector moves up with the can body until the can is chucked. The seaming head is continuously rotating about the chuck and the controlling cross head 37 is then lowered causing the seaming lever carrying the first operation roll to swing and perform the first operation, after which this roll is released and the second operation roll engages the can end and performs the final operation. The closed can is then ejected from the seaming head by the ejecting pad which moves downwardly in time with the support 5. The stripper wheel is then given a quarter turn through the action of the intermittent gear driving connection therefor, and this forces the closed can from its support into a suitable receiving chute. When there are no cans being carried along the conveyer, then the can end feed controlling device will reciprocate its full length and the releasing pawl will be held in position for causing the latch to disengage the pusher slide, so that no can end will be fed underneath the seaming head. The conveyer and also the support for raising the cans to the seaming head may be readily adjusted for closing different sized cans. The can end feeding device may also be suitably adjusted to accommodate different sized ends.

It is obvious that minor changes in the details of construction and arrangement of parts may be made without departing from the spirit of the invention as set forth in the appended claims.

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

1. A can closing machine including in combination, a supporting frame, a seaming head mounted on said supporting frame to rotate in a fixed position thereon, seaming

rolls carried by said seaming head, a main horizontal shaft for rotating said seaming head, a vertical shaft mounted in said frame and operated from said main shaft through a reducing gear, a fixed can end support beneath said seaming head having a tapered opening therethrough for rounding up and centering the can body, and a can end seat on its upper face, means operated by said vertical shaft for controlling the seaming rolls, means movable about the center of said vertical shaft as an axis for placing a can end on said seat, a can body support beneath the seaming head, and means operated by said vertical shaft for raising and lowering said can body support.

2. A can closing machine including in combination, a supporting frame, a seaming head mounted on said supporting frame to rotate in a fixed position thereon, seaming rolls carried by said seaming head, a main horizontal shaft for rotating said seaming head, a vertical shaft mounted in said frame and operated from said main shaft through a reducing gear, a fixed can end support beneath said seaming head having a tapered opening therethrough for rounding up and centering the can body and a can end seat on its upper face, means operated by said vertical shaft for controlling the seaming rolls, means movable about the center of said vertical shaft as an axis for placing a can end on said seat, a can body support beneath the seaming head, means operated by said vertical shaft for raising and lowering said can body support, means for automatically placing the filled cans on said support while in its lower position, and means for stripping the closed cans from the support.

3. A can closing machine including in combination, a supporting frame, a seaming head mounted on said supporting frame to rotate in a fixed position thereon, seaming rolls carried by said seaming head, a main horizontal shaft for rotating said seaming head, a vertical shaft mounted in said frame and operated from said main shaft through a reducing gear, a fixed can end support beneath said seaming head having a tapered opening therethrough for rounding up and centering the can body and a can end seat on its upper face, means operated by said vertical shaft for controlling the seaming rolls, means movable about the center of said vertical shaft as an axis for placing a can end on said seat, a can body support beneath the seaming head, means operated by said vertical shaft for raising and lowering said can body support, means for automatically placing filled cans on said support while in its lower position, and means for stripping the closed cans from the support, said means for placing the filled cans on the support and said means for stripping the cans from the support being actuated by said vertical shaft.

4. A can closing machine including in combination, a supporting frame, a seaming head mounted on said supporting frame to rotate in a fixed position thereon, seaming rolls carried by said seaming head, a main horizontal shaft for rotating said seaming head, a vertical shaft mounted in said frame and operated from said main shaft through a reducing gear, a cam carried by said vertical shaft, a sleeve mounted on the seaming head for operating the seaming rolls, a lever connected to said sleeve for positively moving the same up and down, and a cross head having a positive direct thrust engagement with the lever and with said cam for actuating said lever.

5. A can closing machine including in combination, a supporting frame, a seaming head mounted on said supporting frame to rotate in a fixed position thereon, seaming rolls carried by said seaming head, a main horizontal shaft for rotating said seaming head, a vertical shaft mounted in said frame and operated from said main shaft through a reducing gear, a cam carried by said vertical shaft, a sleeve mounted on the seaming head for operating the seaming rolls, a lever connected to said sleeve for positively moving the same up and down, a cross head having a positive direct thrust engagement with the lever and with said cam for actuating said lever, a second cam on said vertical shaft, an ejecting rod extending through said seaming head, an ejecting pad carried thereby, a lever connected to said rod for positively moving the same up and down, a cross head having a positive thrust engagement with said last named lever and with said last named cam.

6. A can closing machine including in combination, a supporting frame, a seaming head mounted on said supporting frame to rotate in a fixed position thereon, seaming rolls carried by said seaming head, a main horizontal shaft for rotating said seaming head, a vertical shaft mounted in said frame and operated from said main shaft through a reducing gear, means operated by said vertical shaft for controlling said seaming rolls, a can body support beneath the seaming head, means actuated by said vertical shaft for raising the same to bring the can into operative engagement with the seaming head, a rotating drum conveyer actuated from said vertical shaft for placing the filled cans on said can body support, a positively and intermittently operated stripper actuated by said vertical shaft for stripping the closed cans from said can body support, means whereby the position of the conveyer drum and stripper wheel may be varied relative to the seaming head, and means whereby said can body support may be vertically adjusted.

7. A can closing machine including in

combination, a supporting frame, a seaming head mounted on said supporting frame to rotate in a fixed position thereon, seaming rolls carried by said seaming head, a main horizontal shaft for rotating said seaming head, a vertical shaft mounted in said frame and operated from said main shaft through a reducing gear, means operated by said vertical shaft for controlling said seaming rolls, a can body support beneath the seaming head, means for raising and lowering said can body support, a conveyer drum for placing the filled cans on said can body support, means for rotating said conveyer drum from said vertical shaft, a supporting bracket for said conveyer drum, means for adjustably securing said bracket to said frame, means for raising and lowering the bracket, said means for driving the drum from the vertical shaft including devices whereby said bracket may be raised and lowered without disturbing said driving connections.

8. A can closing machine including in combination, a supporting frame, a seaming head mounted to rotate thereon, a supporting plate beneath said seaming head having a tapered opening for rounding up and centering the can body and a seat on its upper face for the can end, a horizontal shaft for rotating said seaming head, a vertical shaft operated by said horizontal shaft and located in a line centrally of the shaft, a bracket carrying said supporting plate, a stack holder mounted on said bracket, and means operating about the axis of said shaft as a center for feeding the can ends in a circular path concentric to the axis of said shaft from the stack holder on to the can end seat in said supporting plate.

9. A can closing machine including in combination, a supporting frame, a seaming head mounted to rotate thereon, a supporting plate beneath said seaming head having a tapered opening for rounding up and centering the can body and a seat on its upper face for the can end, a horizontal shaft for rotating said seaming head, a vertical shaft operated by said horizontal shaft and located in a line centrally of the shaft, a bracket carrying said supporting plate, a stack holder mounted on said bracket, means operating about the axis of said shaft as a center for feeding the can ends in a circular path concentric to the axis of said shaft from the stack holder on to the can end seat in said supporting plate, said can end feeding means including a pusher plate, an oscillating arm, and means for adjustably connecting said pusher plate to said arm.

10. A can closing machine including in combination, a supporting frame, a seaming head mounted to rotate thereon, a supporting plate beneath said seaming head having a tapered opening for rounding up and centering the can body and a seat on its upper face for the can end, a horizontal shaft for rotating said seaming head, a vertical shaft operated by said horizontal shaft and located in a line centrally of the shaft, a bracket carrying said supporting plate, a stack holder mounted on said bracket, means operating about the axis of said shaft as a center for feeding the can ends in a circular path concentric to the axis of said shaft from the stack holder on to the can end seat in said supporting plate, said can end feeding means including a pusher plate for engaging the can ends and carrying the same underneath the seaming head, a latch plate adjustably connected to said pusher plate, a latch carried thereby, an oscillating arm, and a latch plate carried by said oscillating arm and adapted to engage said latch for operating the pusher plate.

11. A can closing machine including in combination, a supporting frame, a seaming head mounted to rotate thereon, a supporting plate beneath said seaming head having a tapered opening for rounding up and centering the can body and a seat on its upper face for the can end, a horizontal shaft for rotating said seaming head, a vertical shaft operated by said horizontal shaft and located in a line centrally of the shaft, a bracket carrying said supporting plate, a stack holder mounted on said bracket, means operating about the axis of said shaft as a center for feeding the can ends in a circular path concentric to the axis of said shaft from the stack holder on to the can end seat in said supporting plate, said can end feeding means including a pusher plate for engaging the can ends and carrying the same underneath the seaming head, a latch plate adjustably connected to said pusher plate, a latch carried thereby, an oscillating arm, a latch plate carried by said oscillating arm and adapted to engage said latch for operating the pusher plate, said latch plate being pivoted to said oscillating arm, and a breakable pin for holding said latch plate in fixed operative relation to said latch.

12. A can closing machine including in combination, a rotating seaming head, means for placing can ends underneath the seaming head including a reciprocating member, a pusher plate, a latch for connecting the pusher plate and reciprocating member, means for conveying the cans underneath the seaming head, means for disconnecting said latch so that the pusher plate may remain idle, and means controlled by the filled cans for rendering said disconnecting means inoperative, said controlling means including an arm adapted to move vertically into and out of engagement with the upper end of the cans and travel therewith.

13. A can closing machine including in combination, a rotating seaming head, means for placing can ends underneath the seaming

head including a reciprocating member, a pusher plate, a latch for connecting the pusher plate and reciprocating member, means for conveying the cans underneath the seaming head, means for disconnecting said latch so that the pusher plate may remain idle, and means controlled by the filled cans for rendering said disconnecting means inoperative, said controlling means including a vertically reciprocating arm, a releasing pawl, and devices controlled by the vertically reciprocating arm for rendering said releasing pawl effective to release the latch when there is no can body on the conveyer underneath the arm.

14. A can closing machine including in combination, a rotating seaming head, means for placing can ends underneath the seaming head including a reciprocating member, a pusher plate, a latch for connecting the pusher plate and reciprocating member, means for conveying the cans underneath the seaming head, means for disconnecting said latch so that the pusher plate may remain idle, and means controlled by the filled cans for rendering said disconnecting means inoperative, said controlling means including a vertically reciprocating arm, means for oscillating the arm in timing with the travel of the cans on the conveyer, a releasing pawl, means for normally holding the releasing pawl out of engagement with the latch, a pin controlled by said arm for lifting the releasing pawl into position to engage the latch, and a locking pawl also controlled by said pin for holding the pawl in releasing position.

In testimony whereof, I affix my signature, in the presence of two witnesses.

IVAR F. WARME.

Witnesses:
F. M. BONTA,
G. J. BARRY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."