

June 10, 1930.

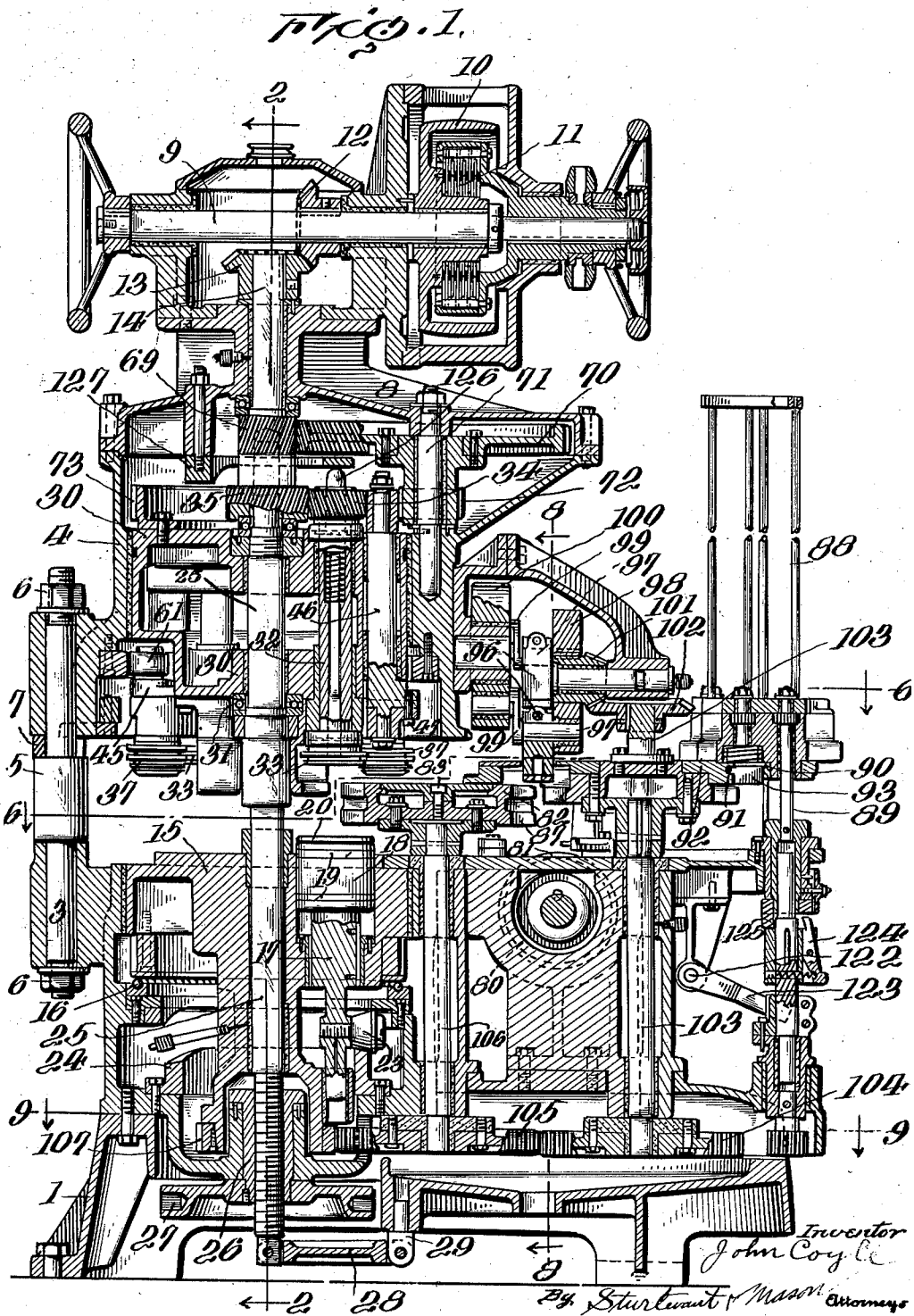
J. COYLE

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MACHINE FOR DOUBLE SEAMING CAN ENDS TO CAN BODIES

Filed March 15, 1928

11 Sheets-Sheet 1



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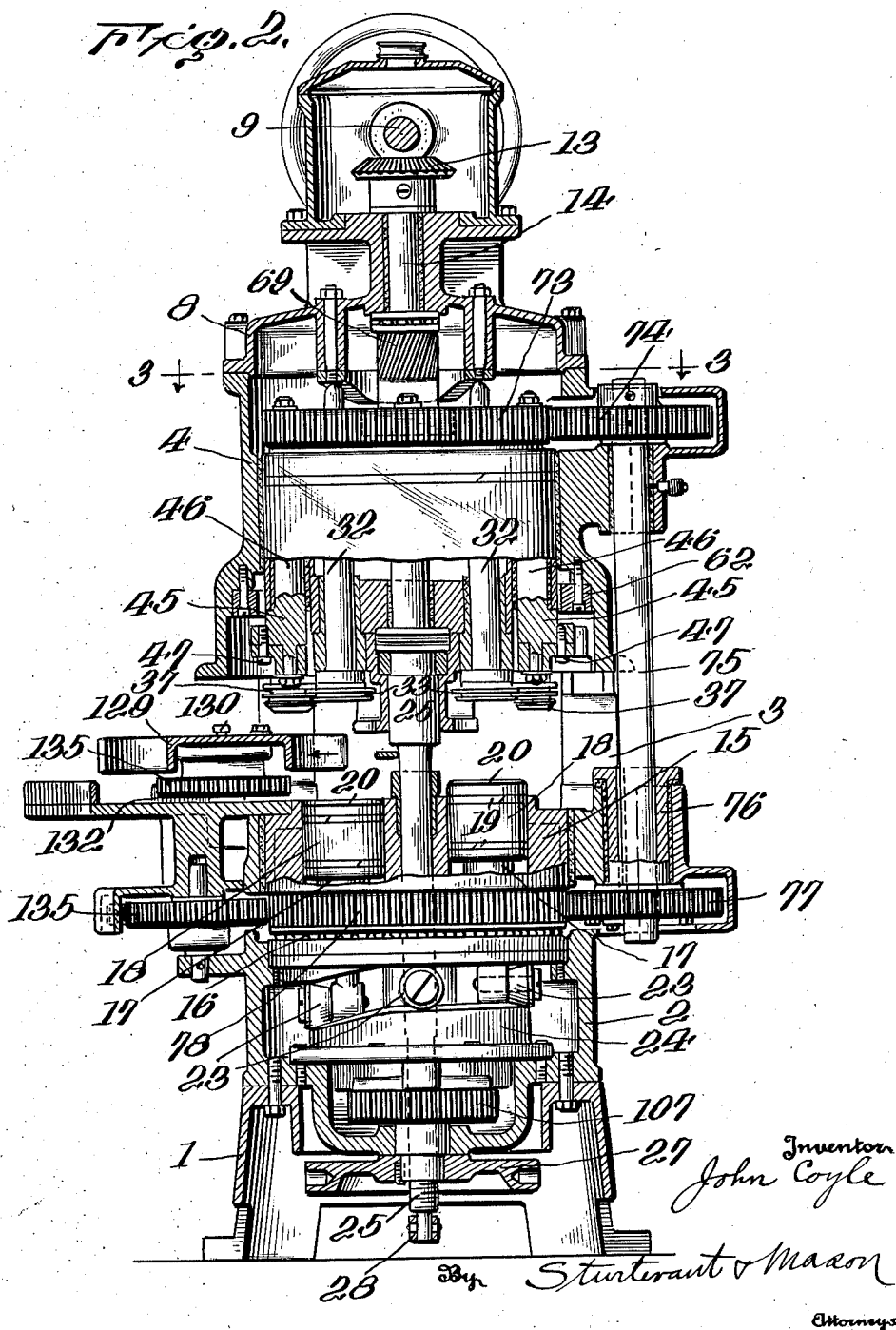
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11 Sheets-Sheet 3

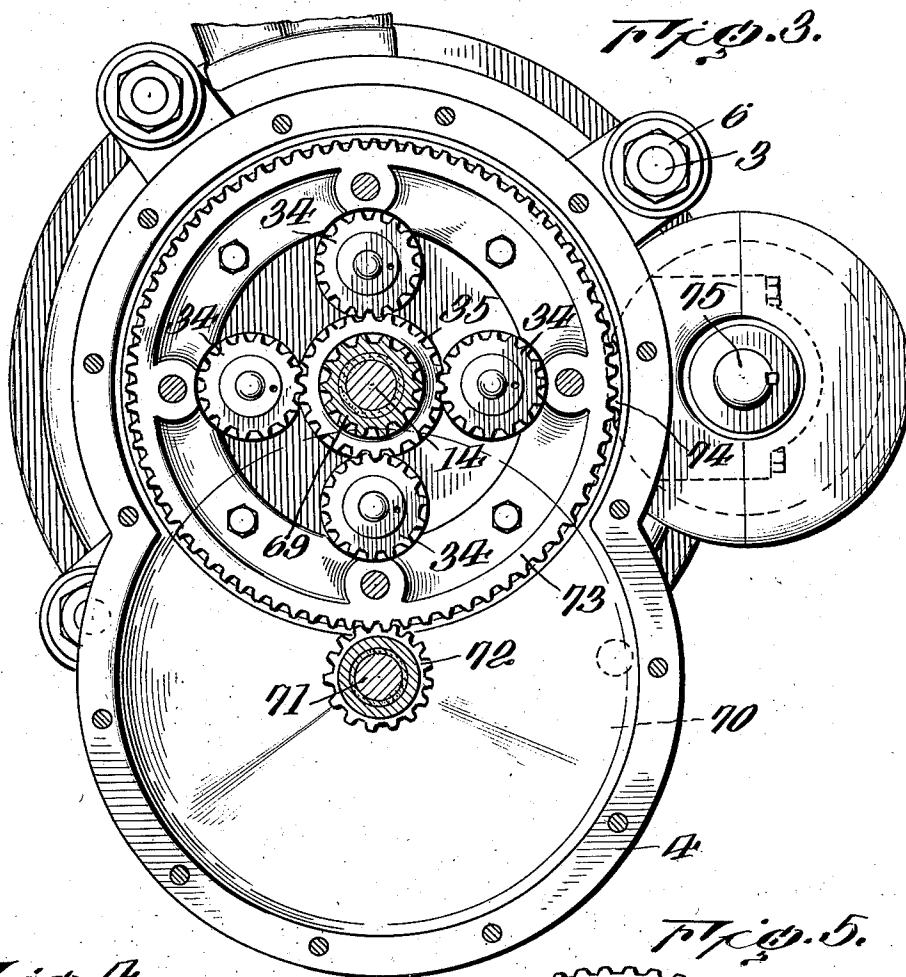


Fig. 4.

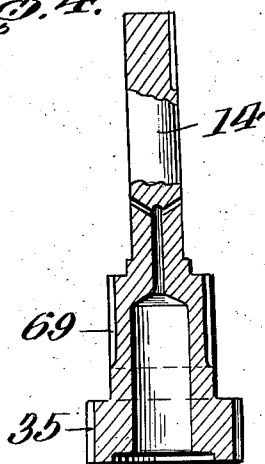
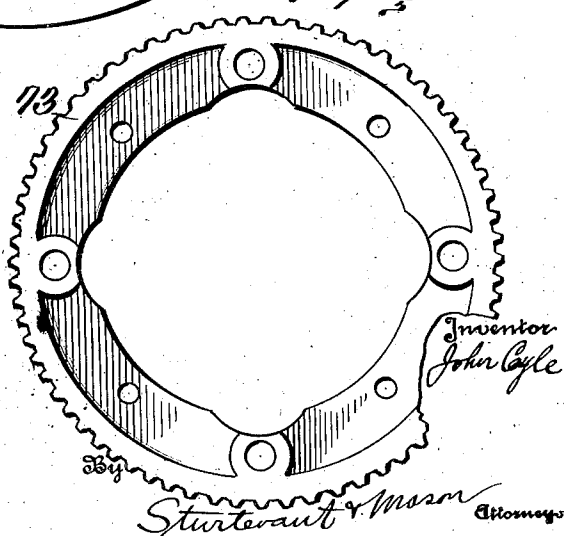


Fig. 5.



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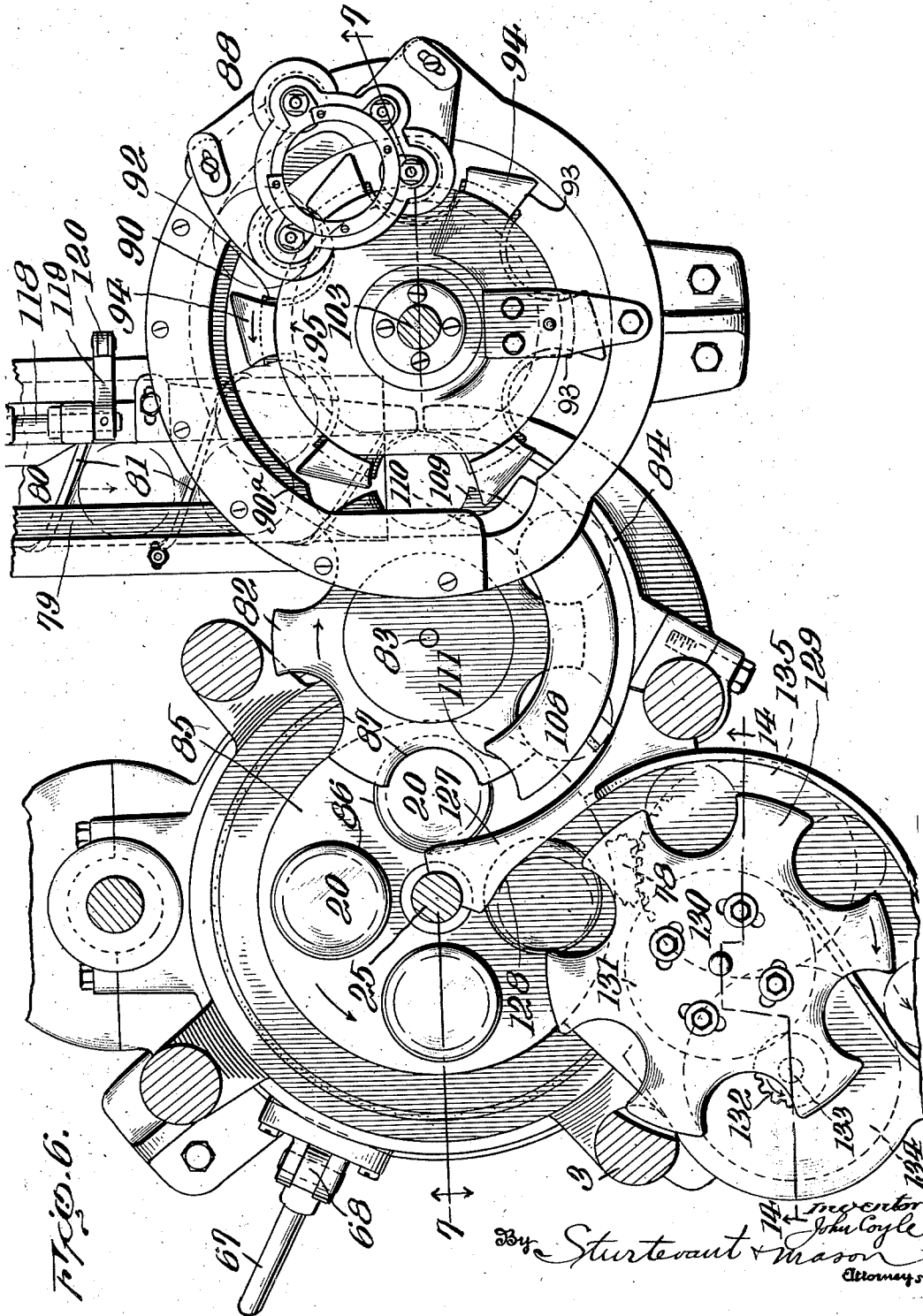
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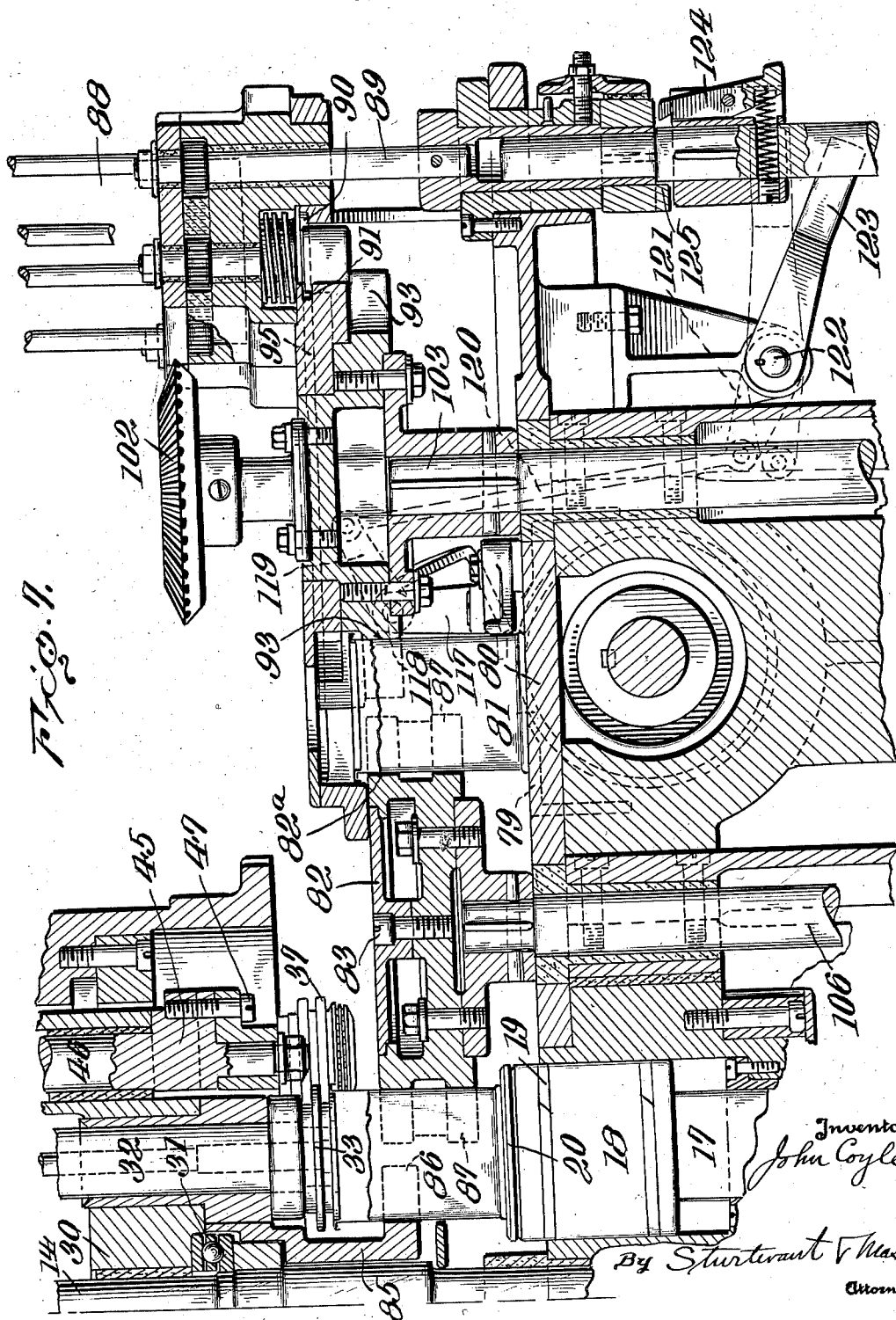
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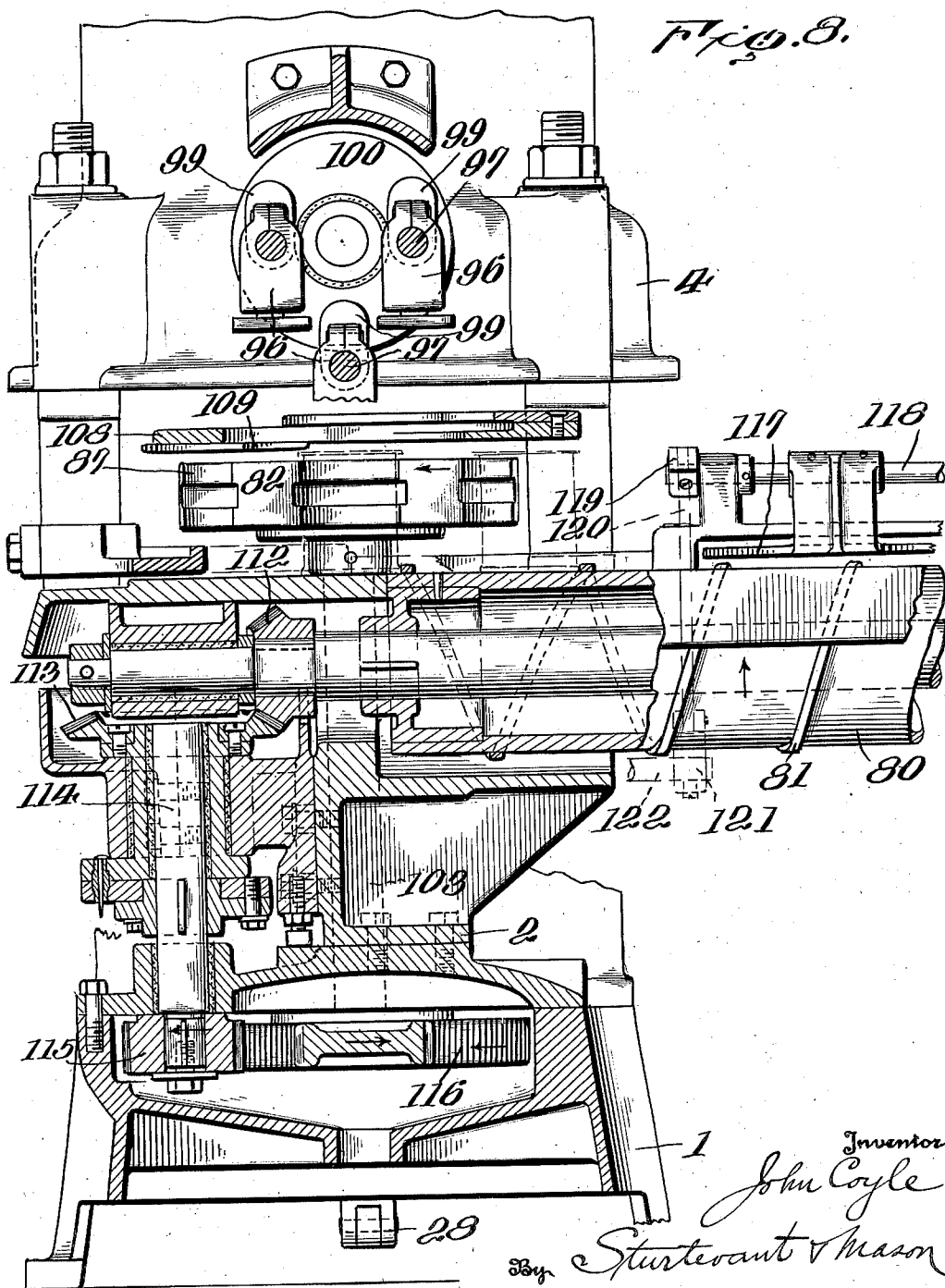
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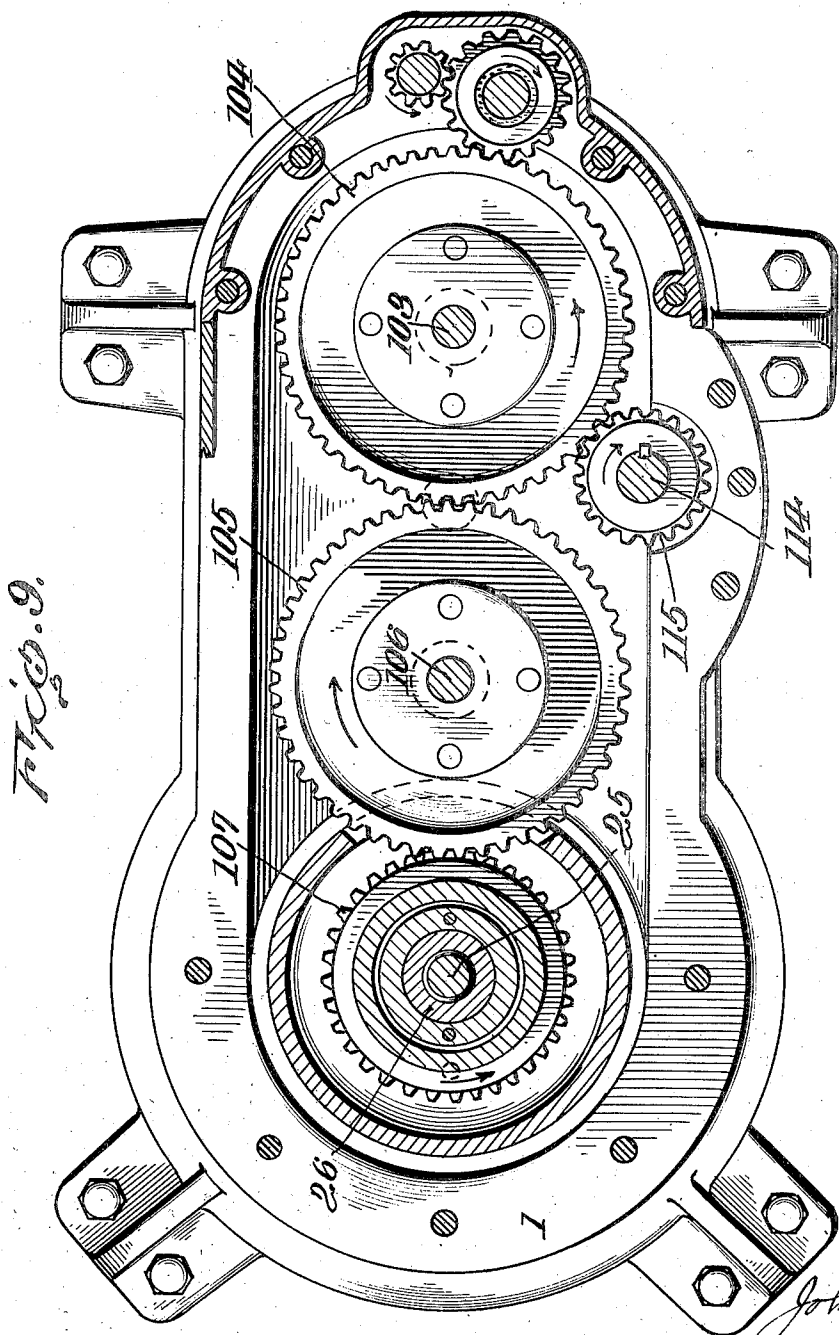
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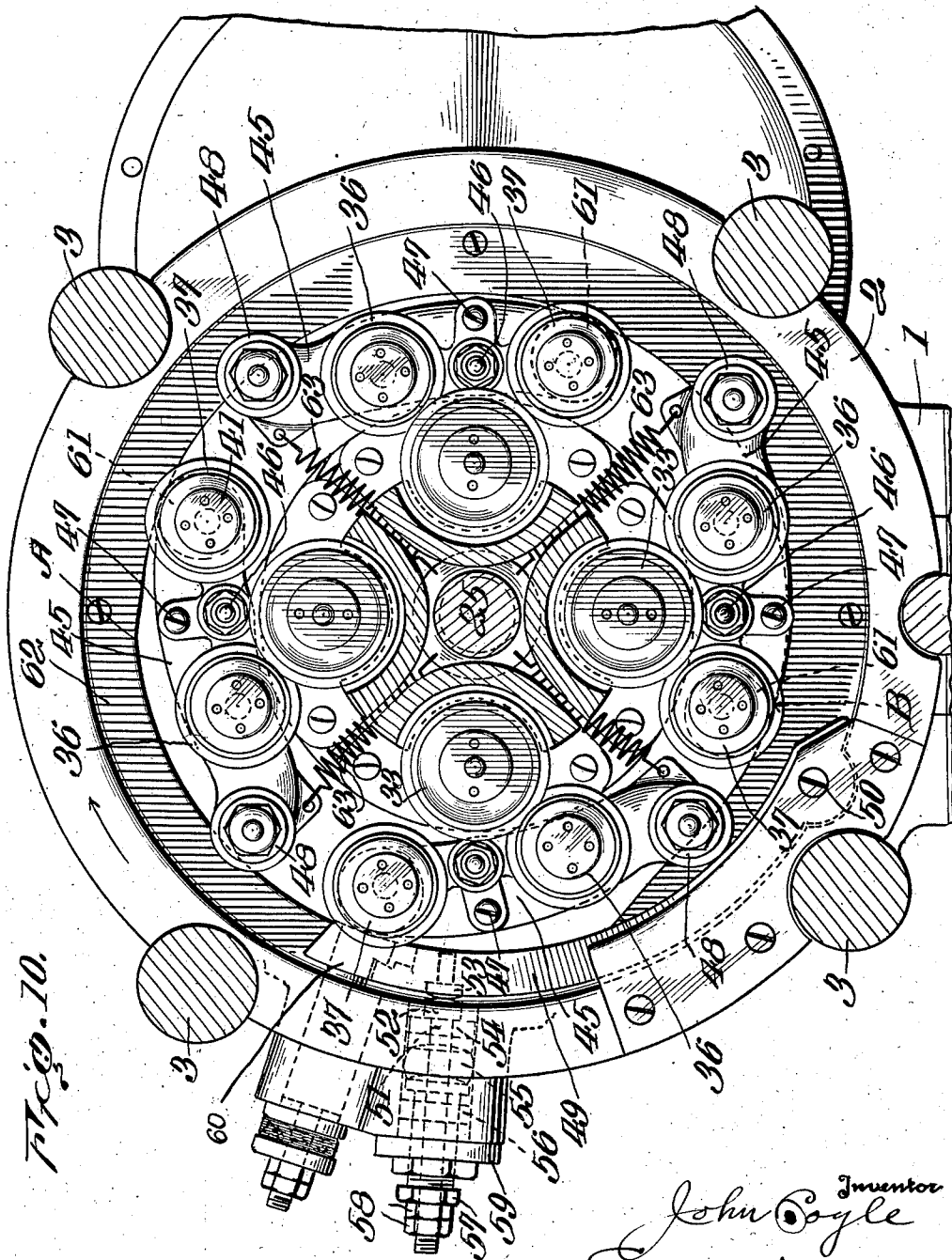
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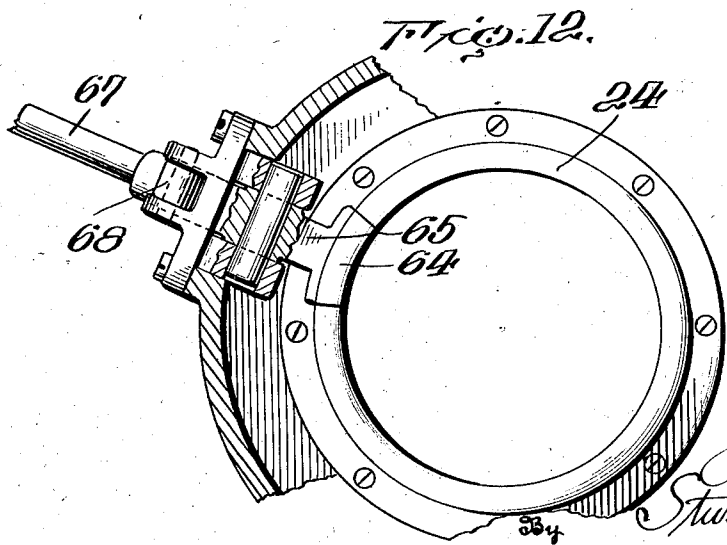
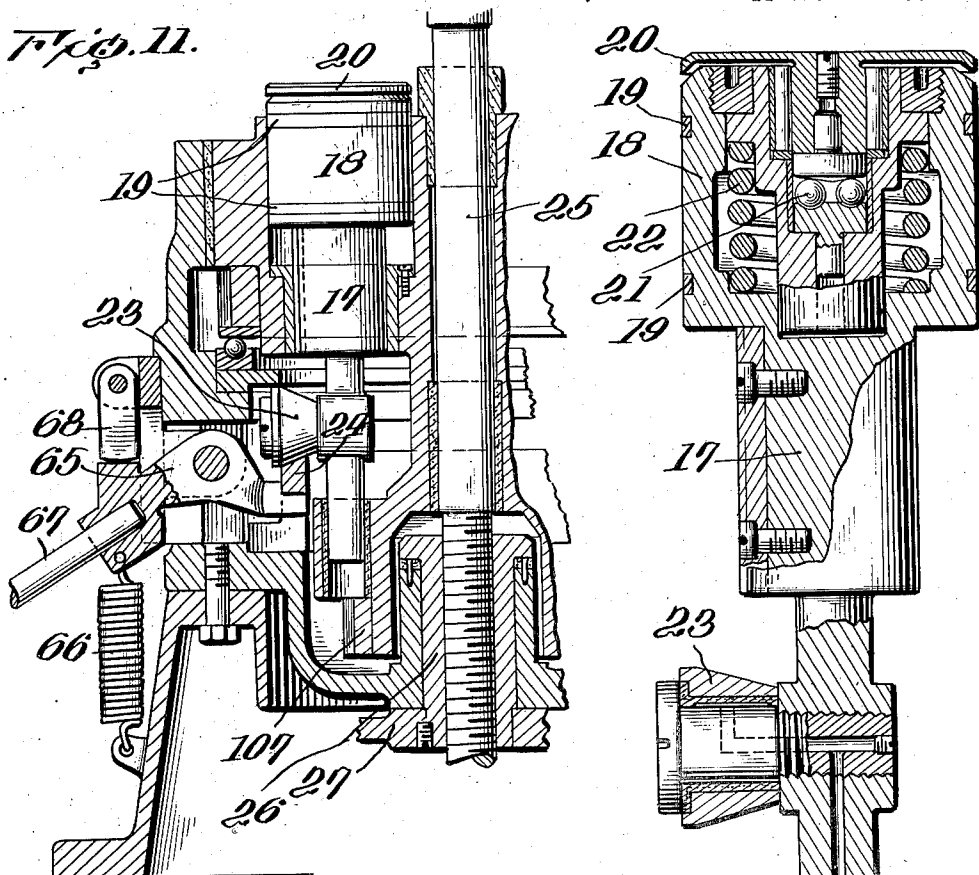
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Fig. 14.

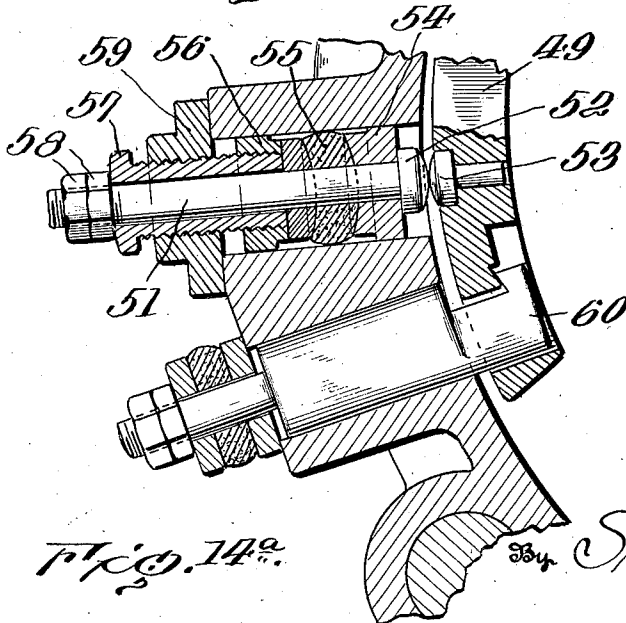
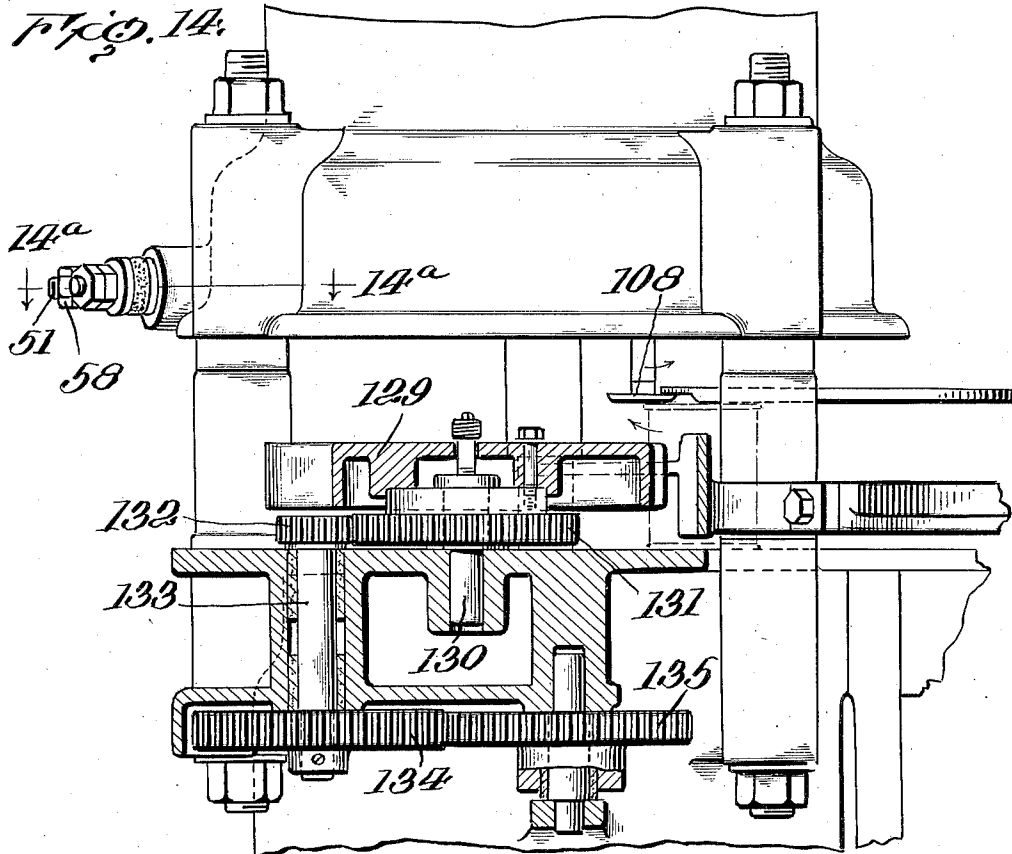


Fig. 14a.

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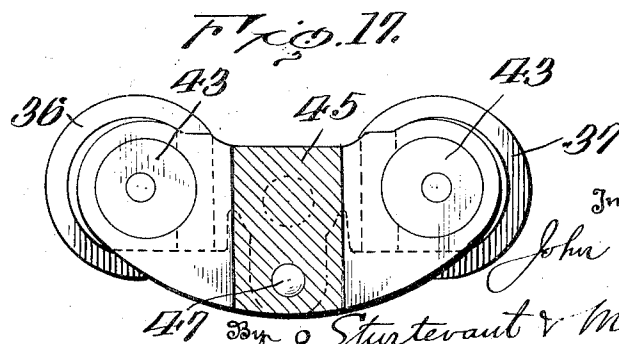
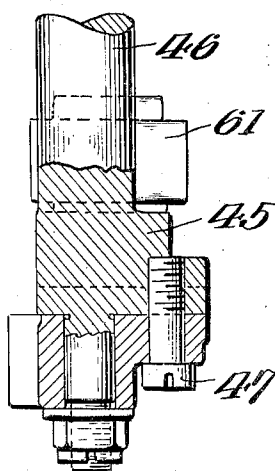
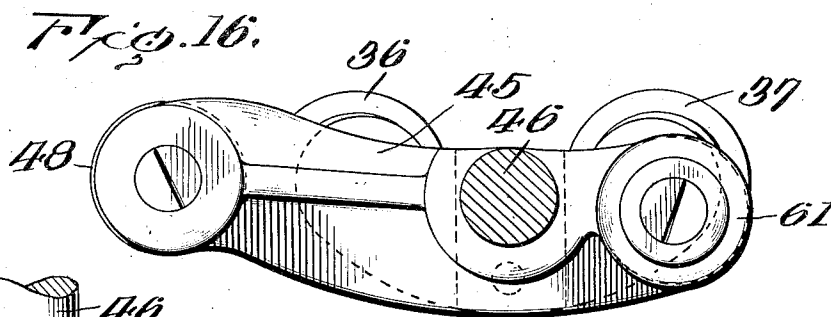
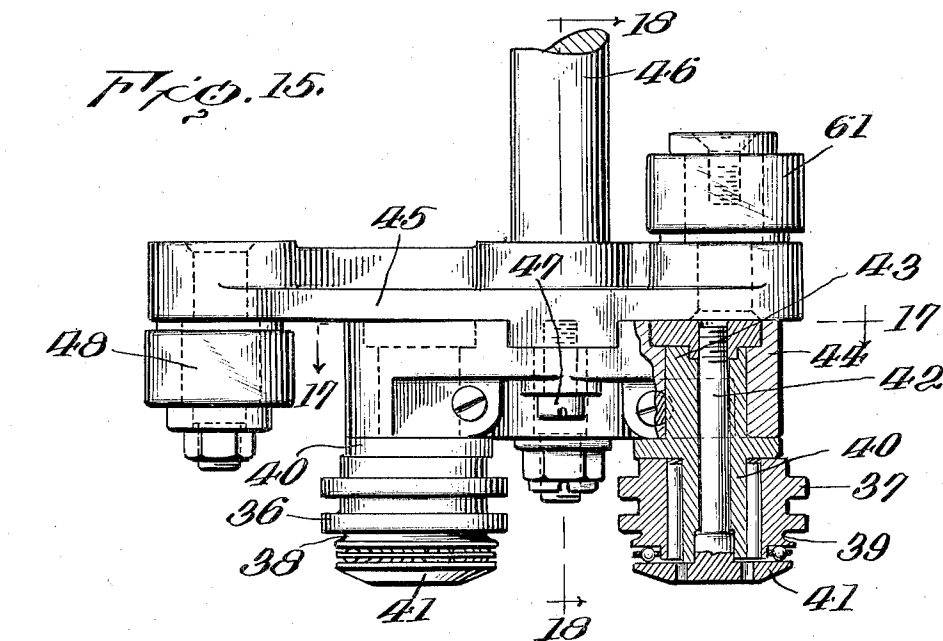


Fig. 18.

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UNITED STATES PATENT OFFICE

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MACHINE FOR DOUBLE-SEAMING CAN ENDS TO CAN BODIES

Application filed March 15, 1928. Serial No. 261,827.

The invention relates to new and useful improvements in machines for double seaming can ends to can bodies, and more particularly to a machine for attaching can ends to filled can bodies for closing the same.

An object of the invention is to provide a closing machine having a plurality of seaming units traveling in a circular path, and a feeding-in mechanism for feeding the filled cans in a straight line to the machine and for directing the same into the curved path of travel of the seaming units, with means for placing a can end on the can body while it is traveling in a straight path of travel, and for positively and firmly seating the end in the can body.

A further object of the invention is to provide a machine of the above type wherein means is provided for holding the can end seated in the can body during its travel from the seating means to the seaming unit.

A still further object of the invention is to provide a machine of the above type with means whereby the can end as it is placed on the can body and seated therein is caused to travel in the same straight line path of travel as the can body.

A still further object of the invention is to provide means for rounding up the can body during its straight path of travel and during the seating of the can end therein.

A still further object of the invention is to provide a double seaming machine of the above type including an upper and lower rotating turret, wherein the upper turret is mounted for rotation in an upper frame supported on columns arranged outside of the turret and positive driving means is also provided outside of the turrets for rotating both turrets.

A still further object of the invention is to provide a machine of the above type wherein the upper rotating turret is supported by a central fixed standard which is adapted to be adjusted for properly positioning the upper turret for operation upon the can which is to be closed.

A still further object of the invention is to provide a machine of the above type, wherein each seaming unit includes a first

and second operation seaming roll, both of which are carried by an oscillating lever which is swung in one direction by an operating cam for performing the first seaming operation, and in the opposite direction by another operating cam for performing the second seaming operation.

A still further object of the invention is to provide a machine of the above type, wherein the cam for oscillating the lever to form the second seaming operation is yieldingly mounted so as to permit the seaming roll to pass over the side seam of the can.

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 vertical sectional view through a machine in a plane containing the axis of the main actuating shaft;

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

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

Fig. 4 is a detail in section of the vertical actuating shaft for the chucks and the rotating turrets;

Fig. 5 is a detail in plan of the driving means for the chucks;

Fig. 6 is a view partly in plan and partly in section on the line 6—6 of Fig. 1;

Fig. 7 is a sectional view on the line 7—7 of Fig. 6;

Fig. 8 is a sectional view on the line 8—8 of Fig. 1;

Fig. 9 is a sectional view on the line 9—9 of Fig. 1;

Fig. 10 is a view partly in section and partly in plan of the upper turret, the view being taken from beneath the turret looking upward;

Fig. 11 is a sectional view showing the means for releasing the can;

Fig. 12 is a view partly in section for releasing the can support between the first and second operations;

Fig. 13 is a sectional view through the can support;

Fig. 14 is a sectional view on the line 14—14 of Fig. 6, showing the lower portion of the upper turret, certain of the parts being omitted;

Fig. 14^a is a sectional view on the line 14^a—14^a of Fig. 14;

Fig. 15 is a view partly in section and partly in side elevation, showing the seaming roll and the means for supporting and operating the same;

Fig. 16 is a plan view of the parts shown in Fig. 15;

Fig. 17 is a sectional view on the line 17—17 of Fig. 15, and

Fig. 18 is a view on the line 18—18 of Fig. 15.

The invention is directed broadly to a machine for double seaming a can end to a can body and includes a supporting base forming a lower frame for the machine on which columns are mounted, and on these columns is supported an upper frame. Mounted on the lower frame is a lower rotating turret carrying the traveling supports for the can bodies to which the can ends are to be attached. Mounted on the upper frame is the upper rotating turret which carries the seaming units. There are a plurality of seaming units, and each unit includes a chuck which is positively rotated for engaging the can end and rotating the can end and can body and seaming rolls for joining the end to the can body. There are first and second operation seaming rolls in each unit, and these seaming rolls are carried by an oscillating lever which is moved in one direction by an operating cam during the bodily travel of the turret for forming the first seaming operation, and then in the other direction by a cam during the rotation of the turret for forming the second seaming operation. The cam which oscillates the lever for forming the second operation is yieldingly mounted so as to permit the seaming roll to pass over the side seam of the can body. The seaming rolls are adjustably mounted on the oscillating lever therefor. The support for the can body is raised and lowered by a cam which has a section which may be depressed when the support for the can is directly above the same. This depressible portion of the cam is so disposed that the machine may be stopped with the support directly above the depressible portion between the first and second operations, and the can removed for inspection. The upper turret is supported in the upper frame by a central stationary standard. This standard may be raised and lowered, and thus the turret positioned for proper operation upon the can to be closed. The upper frame is adjustably attached to the supporting column so that the upper frame may be raised or lowered. The turrets are rotated by a vertical shaft which has a gear connection with each turret. The can

bodies are delivered to the seaming machine by a feeding-in mechanism which feeds the can in a straight line path of travel to a rotating turret which transfers the can by a curved path of travel to the seaming units. The seaming units travel in a curved path. The can ends are delivered one at a time from the stack when a can body is fed to the machine, and these can ends are placed above the can bodies during their straight path of travel and are then permitted to drop on to the can bodies. At this time, a traveling seating device engages a can end and positively seats it in the can body. This occurs while the can body is moving in its straight path of travel. The seated can end is then passed beneath a holding plate which holds the can end seated during its curved path of travel by a transfer turret, and thus it is that the can end is held seated until it is engaged by the chuck of the seaming unit.

Referring more in detail to the drawings, the double seaming machine includes a supporting base 1 on which is mounted the lower frame 2. This lower frame 2 is provided with a series of columns 3. As shown in Fig. 6, there are four columns, and these columns support at their upper ends, the upper frame 4 of the machine. Each column includes a central fixed portion 5 which rests on the lower frame, and the columns are held to the frame by means of nuts 6 which are threaded on to the ends of each column. U-shaped blocks or shims 7 may be placed between the fixed portion 5 and the upper frame for setting the upper frame at different levels.

Mounted on the upper frame is an auxiliary frame unit 8 which is provided with suitable bearings for a main actuating shaft 9. This main actuating shaft 9 is driven from a suitable source of power, which, as illustrated, includes a driving pulley 10. The driving pulley 10 is connected to the main actuating shaft by means of a dry disk clutch 11. Mounted on this main actuating shaft 9 is a bevel gear 12 which meshes with a bevel gear 13 carried by a short vertical shaft 14. Located in the lower frame 2 is a lower rotating turret 15. This rotating turret 15 rests on ball bearings 16, and said turret is provided with a series of can supports 17, one of which is shown in detail in Fig. 13. This can support includes an upper piston member 18 provided with suitable packing rings 19 and this upper piston member 18 carries a can support 20. This can support is mounted on ball bearings 21 so that it may rotate freely. It is also yieldingly supported by means of a spring 22. This can support 17 is mounted on the lower turret so that it is free to be moved up and down. It travels with the turret, but the main portion of the support does not rotate with the turret. The supporting part 20 does, however, rotate with the can. The support 17 is raised and lowered

by means of a roller 23 which cooperates with a cam 24 shown in detail in Fig. 1. Extending up through this lower turret is a standard or stationary shaft 25. This standard is threaded at its lower end, and the threaded portion of the standard engages a threaded sleeve 26. The threaded sleeve 26 is suitably supported in the lower frame so that it may be rotated by means of a hand-operated wheel 27. The standard 25 is held from rotation by means of an arm 28 which is connected to a lug 29 attached to the supporting base of the machine. This standard 25 carries an upper rotating turret 30. The upper rotating turret is mounted in the upper frame, so that it freely rotates therein. The upper turret, however, is supported on the ball bearing 31 which is carried by this standard 25. By turning the hand wheel 27, the standard 25 may be raised or lowered, and this will raise or lower the upper turret relative to the lower turret. This permits of a limited adjustment to bring about the proper positioning of the upper turret relative to the lower turret. It also permits of a much greater adjustment when the upper frame is adjusted relative to the lower frame so that the machine may be properly set for operating upon different size cans. Mounted on this upper turret is a series of seaming units. As shown in the drawings, there are four seaming units. Each seaming unit includes a spindle 32 carrying a chuck 33. This chuck is located directly above the can support 20, and in axial alinement therewith. The can with the end seated therein is placed on the support and the support is raised as the turrets travel, so as to lift the end into engagement with the chuck 33, and this completes the chucking operation of the can end and can body. The spindle 32 carrying the chuck is positively rotated, and this will rotate the can end and can body. This rotation of the spindle 32 is accomplished by means of gears 34. There is a gear on each spindle, as clearly shown in Fig. 3. These gears 34 mesh with a gear 35 formed as a part of the vertical shaft 14. The shaft 14, as above noted, is rotated by the main actuating shaft, and this, through the gears described, imparts a positive rotation to each chuck, which in turn rotates the can body and seated can end therein.

Each seaming unit also includes a first operation seaming roll 36, and a second operation seaming roll 37. The first operation seaming roll is provided with a seaming groove 38 which is of the usual construction, and the second operation seaming roll is provided with a groove 39 which is likewise of the usual construction. These seaming rolls are each mounted on a supporting sleeve 40 and are held thereon by a face plate 41 carried by a threaded stem 42. The sleeve 40 is provided with an eccentric portion 43. The eccentric portion 43 of the sleeve is in turn

mounted in a supporting plate 44. The means for supporting and mounting the first and second operation rolls are similar, and the eccentric portions of the sleeves carrying the seaming rolls are mounted at the opposite ends of this supporting plate 44. The supporting plate 44 is carried by a rock lever 45. The rock lever is rigidly attached to a supporting shaft 46 mounted in suitable bearings in the upper turret, so that the shaft 46 may oscillate freely. The supporting plate 44 has a keyed connection to this rock lever 45 and is held attached thereto by a bolt 47. The seaming rolls in each unit are so disposed that one seaming roll is at one side of the axis of the shaft 46, while the other seaming roll is at the other side thereof. The shaft 46 is located in the turret radially a greater distance from the center of rotation of the turret than the chuck spindle, so that the seaming rolls in their path of travel, are wholly outside of the path of travel of the center of the chuck. This is quite an important feature, as it enables the chucks to be placed very close to the center of rotation of the turret, and this enables the centers of the chucks circumferentially to be placed comparatively close together, and the cans as it travels in its curved path during the seaming operation, moves in a circular path on a relatively small radius. Two objects are accomplished by this positioning of the seaming rolls relative to the chucks, and shortening the space between the chucks and reducing the radius of the path of travel of the chucks. First, the space between the cans is reduced to a minimum and the speed of travel of the can is also reduced to a minimum. This is of particular advantage in a machine for closing filled cans where it is desired to avoid all possible spill of the contents of the can. By placing the cans close together, very much less acceleration is required in order to place the cans properly for the seaming operations.

The lever 45 which carries the seaming rolls is oscillated first in one direction and then the other. The lever is moved in one direction by means of a roller 48. This roller 48 cooperates with a cam 49 (see Fig. 10). The turret rotates in the direction of the arrow in Fig. 10. The cam 49 is pivoted at 50, and is yieldingly pressed toward the center of the turret by means of a pressure rod 51. This rod is provided with a rounded head 52 which engages the rounded head 53 of a pin carried by the cam 49 (see Fig. 14^a). The head 52 of the rod bears against a block 54 which in turn bears against an elastic pad 55. The elastic pad rests against a block 56 which is threaded on to the end of a sleeve 57. The rod passes through this sleeve, and nuts 58 on the end of the rod, provide for a slight adjustment of the block 54, compressing the elastic or rubber pad 55. The sleeve 57 is threaded into a cap plate 59, and this

permits of the adjustment of the rod 51 to vary the tightness of the seam. This cam 49 oscillates the lever carrying the seaming rolls so as to cause the second operation roll to engage the can end and form a second seaming operation thereon. The cam yields to allow the roll to pass over the side seam of the can. A limiting stop 60 is provided which limits the movement of the cam when the roll passes off from the same. The lever is swung in the opposite direction by a roller 61 which cooperates with a stationary cam 62 secured to the upper frame. The swinging of the lever begins when the roller 61 reaches a point A on the cam 62. The seaming roll is gradually forced into contact with the can end, and the first seaming operation performed. When the point B is reached, then the seaming roll is permitted to move away from the can end, and this is brought about by means of a spring 63 and also by the roller 48 cooperating with the cam 49.

The cam 24 which raises and lowers the support for the can, has a depressible portion 64 carried by a rocker 65. A spring 66 normally holds this depressible portion raised. A rod 67 may be connected to the rocker for swinging the same against the action of the spring 66, and thus the depressible portion may be lowered. When the turrets are stopped with the can support directly over this depressible portion, the depressible portion, through the mechanism described, may be lowered, and this will lower the can, freeing the same from the chuck, so that it may be removed from the machine for inspection. The holding dog 68 serves to hold the depressible portion of the cam in raised position during the normal operation of the machine.

The vertical shaft 14 carries a gear 69. This gear meshes with a gear 70 on the counter-shaft 71. This counter-shaft is mounted in suitable bearings in the upper frame. The counter-shaft carries a gear 72 which in turn meshes with a gear 73 rigidly attached to the upper turret. Thus it is that the shaft 14 imparts rotation to the upper turret and the speed of rotation of the upper turret is greatly reduced over that imparted to the chuck spindles which rotate the cans. Also meshing with this gear 73 is a gear 74 carried by a vertical counter-shaft 75. This counter-shaft is mounted in suitable bearings in the upper frame. Mounted on the counter-shaft 75 at the lower end thereof is a sleeve 76. The sleeve is splined to the counter-shaft. This sleeve is journaled in the lower frame and carries a gear 77 which meshes with a gear 78 carried by the lower turret. By the mechanism described, both the upper and lower turrets are positively driven from the shaft 14, and they are driven by this vertical shaft which is located outside of the turrets. Through this arrangement,

the center standard may be made comparatively small, as its sole purpose is to support the upper turret. By making this standard small, the chuck centers may be thus further moved in toward the center of rotation of the turrets.

The machine as shown, is particularly adapted for closing filled cans. The cans are delivered to the machine by a feeding-in mechanism, which includes, as illustrated, a support 79 with which is associated a feed drum 80 having a thread 81 thereon. Alongside of the support is a guiding rail, and the filled cans are fed one after another, along this support and guiding rail in a straight line path of travel. The cans are delivered to a transfer turret 82 (see Fig. 6) which is mounted to rotate about a center 83. This transfer turret moves the cans along the guide rail 84 in a curved path of travel, and delivers the cans to the rotating turrets of the seaming machine. Located between the rotating turrets and rotating with the upper turret, is a member 85 which is provided with half-molds 86. The transfer turret is provided with half-molds 87, and thus it is that the can is centered beneath the chuck of the seaming unit.

The can ends are fed from a stack holder 88. They are released one at a time by a can end feeding mechanism which is driven from a shaft 89. When the can ends are released, they drop on to suitable supporting ledges 90 and 91 (see Fig. 7). They are moved along these supporting ledges by a rotating turret 92. This rotating turret is formed with a series of segmental pockets 93 which serve to center the can ends over the can bodies and also serve to cooperate with the transfer turret 82 in rounding up the can body. As clearly shown in Fig. 7, the portion of the segmental pocket in the turret 92 which engages the can, engages said can beneath the flange therein. The same is true of the segmental pockets 82^a in the transfer turret 82. The can ends are moved along the supports 90 and 91 by means of lugs 94. At the inner side of the ledge 91 there is a cam face 95. This can ledge is so shaped that it gradually forces the can end outwardly radially of the turret 92, and places the can end over the can body while it is moving in a straight line path of travel along the support 79. The supporting ledge 90 is cut away at 90^a, and the supporting ledge 91 is similarly cut away, so that when the can end reaches the position where it is directly over the traveling can body to which it is to be attached, it will drop on to the can body. At this time, the pockets of the turrets 92 and 82 are moving into engagement with the can body, rounding up the same, and they also center the can end over the can body. The can body and can end thus positioned, have a short straight path of travel before the can

body starts on its curved path of travel along the guide 84.

While this can end and can body are moving through this straight path of travel after they have been assembled, and the end 5 dropped on to the can body, a seating pad or member engages the can end and forces the can end into the can body. This means for seating the can ends is shown in Figures 10 1 and 8 of the drawings. There are three seating pads 96 which come into operation in succession, and only one pad operating upon a single can. Each seating pad is carried by a shaft 97. The shaft 97 is journaled 15 in a rotating disk 98. The shaft 97 carries a crank arm 99 which is provided with a crank, and this crank, in turn, is mounted in a rotatable disk 100. The disk 98 is driven by means of a gear 101 which meshes with 20 a gear 102 carried by a vertical shaft 103 which supports the turret 92. This shaft 103 is journaled in the lower frame, and carries a gear 104 which meshes with a gear 105 carried by a shaft 106. The shaft 106 25 carries the transfer turret 82. The gear 105 meshes with a gear 107 which is attached to the lower turret. As the lower turret rotates, it rotates the shaft 106, which rotates in turn the transfer turret, and it rotates 30 the shaft 103 which rotates in turn the can end turret. At the same time, this shaft 103 rotates the disk 98, and this will cause the seating pads to move bodily in a curved path of travel, always remaining in the same 35 horizontal position relative to the supporting shaft on which the seating pad is carried. In other words, the seating pad comes down into engagement with the can end, forcing it into the can body, and then moves 40 out of contact with the can end, traveling in the vertical plane containing the straight line path of travel of the can body and can end. This seating pad holds the can end seated in the can body while the can is traveling forward until the end has moved underneath the seating plate 108. The seating 45 plate 108 is curved to conform to the path of travel of the can as it is moved along the guide rail 84 by the rotating transfer turret 82. The receiving end of this plate 108 is curved as indicated at 109, and it is the point 50 110 that first engages the can end and holds it seated on the can body. While the can is moving forward to position the end underneath this portion 110 of the seating plate 55 108, it is held seated by the seating pad. The cut away portion at the receiving end of the seating plate is to give clearance for the movement of the seating pad. It is to be 60 understood, however, that the can end is placed on the can body and positively seated therein by the seating pad, and while it is held fully seated in the can body, the can end and can body move under this seating plate, 65 which holds the can end seated as it moves

along its curved path of travel. By this arrangement, the can end is so firmly seated on the can body while it is moving along its straight path of travel, that there is little or no spill incident to the changing of the direction of movement of the can body into a curved path of travel. 70

The opposite end 111 of the seating plate is likewise curved slightly, and terminates at a point so that the can and seated can end 75 may be raised into engagement with the chuck of the seaming unit.

The feed drum is carried by the shaft which is journaled in the lower frame, and said drum is provided with a bevel gear 112 80 which meshes with a bevel gear 113 carried by a counter shaft 114. This counter shaft 114 carries a gear 115 which meshes with a gear 116 carried by the shaft 103. Located alongside of the drum is a movable plate 117 85 carried by a shaft 118. When the can body moves along the drum, it will engage the plate 117 and swing the plate, and this will oscillate the shaft 118. The shaft 118 carries an arm 119 which is connected by means 90 of a link 120 to an arm 121 carried by the shaft 122. The shaft 122 carries an arm 123 which is moved into and out of the path of travel of the dog 124. This dog 124 is carried by the lower section of the shaft 89, and 95 serves to engage the lug 125, when swung inward, so as to couple the two sections of the shaft together. This mechanism forms no part of the present invention. It is for the purpose of feeding a can end only when 100 a can body to which it is to be attached has been fed into the machine. After the can ends have been double seamed to the can bodies, they are forcibly ejected from the chuck when the support is lowered, by means 105 of an ejecting pad carried by a rod 126 which cooperates with a stationary cam 127. After the cans have been forcibly stripped from the chucks, they are removed from the machine by means of a guiding rail 128 110 which is formed as a part of the guiding rail 108. A rotating take-away turret 129 is mounted at the upper end of a shaft 130 which carries a gear 131. This gear meshes with a gear 132 carried by a counter shaft 115 133. The counter shaft carries a gear 134 which in turn meshes with a gear 135. The gear 135 meshes with the gear 78 of the lower rotating turret. It will be apparent from Fig. 6 of the drawings that this guiding rail 120 128 moves the closed can off from this traveling support into the pocket of the take-away turret, and the take-away turret then engages the can body and conveys it out of the machine into a suitable runway therefor. 125 This take-away turret is adjustably connected to its operating shaft and is so disposed relative to the center of rotation of the seaming machine that the closed cans may be quickly removed from the machine and 130

at a point very near to the point where the cans pass into the seaming machine to the seaming units.

It is thought that the operation of the machine will be clear from the details of the description which has been given above. The filled cans, when the machine is used for closing filled cans, are fed one at a time along a straight path of travel. A can end is placed over the filled can and dropped on to the same. It is centered relative to the filled can and positively seated on the filled can while this filled can is in its straight path of travel. It is held seated on the filled can body as the can body moves in its curved path of travel through the aid of the transfer turret into the seaming machine. The can body with the can end seated therein is centered beneath the traveling seaming unit, is chucked, and the seaming rolls, one after another, are moved into contact with the can end for forming the seaming operation. After the can is closed, it is positively stripped from the chuck as the support for the can is lowered, and the take-away devices remove the closed cans from the machine.

It will be understood that the machine may be used for attaching can ends to can bodies in the formation of the can as well as for closing a can. It will be understood also that the seaming units may be changed as to construction, from certain aspects of the invention, and it will also be understood that the means for seating the can ends in the can bodies and feeding the same to the seaming units may also be varied from other aspects of the invention. It will further be understood that various changes in the details of construction and the arrangement of the parts may be made without departing from the spirit of the invention as set forth in the appended claims.

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

1. The combination of a plurality of seaming units traveling in a circular path, each including a chuck, a feeding mechanism for feeding can bodies in a straight line and then in a curved path to the seaming units, means for placing a can end on the can body while it is traveling in the straight path of travel and for positively and firmly seating the end in the can body, and means for holding the can end seated in the can body while on its curved path of travel until engaged by the chuck of the seaming unit.

2. The combination of a plurality of seaming units traveling in a circular path, each including a chuck, a feeding mechanism for feeding can bodies in a straight line and then in a curved path to the seaming units, means for feeding a can end in a straight path over the can body while said can body is traveling in a straight path, means for positively and

firmly seating the end in the can body, and means for holding the can end seated in the can body while on its curved path of travel until engaged by the chuck of the seaming unit.

3. The combination of rotating turrets, a plurality of seaming units mounted in said rotating turrets and traveling therewith, each seaming unit including a chuck and seaming rolls, a feeding mechanism for feeding can bodies in a straight line and then in a curved path beneath the chuck of the seaming unit, and means for placing a can end on a can body and for positively and firmly seating the end in the can body in its straight path of travel.

4. The combination of rotating turrets, a plurality of seaming units mounted in said rotating turrets and traveling therewith, each seaming unit including a chuck and seaming rolls, a feeding mechanism for feeding can bodies in a straight line and then in a curved path beneath the chuck of the seaming unit, means for placing a can end on a can body and for positively and firmly seating the end in the can body in its straight path of travel, and means for holding a can end seated in the can body until engaged by the chuck of the seaming unit.

5. The combination of a plurality of seaming units traveling in a circular path, a feeding mechanism for feeding can bodies in a straight line and then in a curved path to the seaming units, means for placing a can end over the can body, and means for engaging the can end and seating the same in the can body while the can body is moving in a portion of the straight line path of travel, said last-named means including a series of pads mounted for bodily travel in a circular path in a vertical plane and positioned so as to engage the can end and force the same into the can body while moving in the direction of travel of the can body.

6. The combination of a plurality of seaming units traveling in a circular path, a feeding mechanism for feeding can bodies to the seaming units including a rotating turret and devices for moving the can bodies in a straight line of travel into said rotating turret, means for placing a can end on the can body, and means for seating the can end in the can body while moving through a portion of its straight line of travel.

7. The combination of a plurality of seaming units traveling in a circular path, a feeding mechanism for feeding can bodies to the seaming units including a rotating turret and devices for moving the can bodies in a straight line of travel into said rotating turret, means for placing a can end on the can body, means for seating the can end in the can body while moving through a portion of its straight line of travel, and means for holding a can end seated in the can body while

the same is moved by the turret to the seaming unit.

8. The combination of a plurality of seaming units traveling in a circular path, a feeding mechanism for feeding can bodies to the seaming units including a rotating turret having a series of half-molds for receiving and placing the can bodies in the seaming units, a feed drum, a support having a guide rail along which the can bodies are moved by the drum into the half-molds of the turret, means for placing a can end on a can body, and means located above the path of travel of the can bodies for engaging the ends and firmly seating the same in the can bodies while said can bodies are still on a straight line of travel.

9. The combination of a plurality of seaming units traveling in a circular path, a feeding mechanism for feeding can bodies to the seaming units including a rotating turret having a series of half-molds for receiving and placing the can bodies in the seaming units, a feed drum, a support having a guide rail along which the can bodies are moved by the drum into the half-molds of the turret, means for placing a can end on the can body, means located above the path of travel of the can bodies for engaging the ends and firmly seating the same in the can bodies while said can bodies are still on a straight line of travel, and a curved presser plate for engaging the can ends and holding the same seated in the can bodies until the can bodies are delivered to the seaming units.

10. The combination with a lower frame, an upper frame, a rotating turret mounted in the lower frame, a cooperating rotating turret mounted in the upper frame, seaming units carried by said rotating turrets, columns located outside of said turrets in said lower frame and supporting said upper frame, and means located outside of said turrets for positively connecting said turrets for rotation.

11. The combination with a lower frame, an upper frame, a rotating turret mounted in the lower frame, a cooperating rotating turret mounted in the upper frame, seaming units carried by said rotating turrets, columns located outside of said turrets in said lower frame and supporting said upper frame, means located outside of said turrets for positively connecting said turrets for rotation, and means whereby the turret in the upper frame may be raised and lowered relative to the turret in the lower frame.

12. The combination with a lower frame, an upper frame, a rotating turret mounted in the lower frame, a cooperating rotating turret mounted in the upper frame, seaming units carried by said rotating turrets, columns located outside of said turrets in said lower frame and supporting said upper frame, means located outside of said turrets

for positively connecting said turrets for rotation, a center stationary standard carried by the lower frame and supporting the turret in the upper frame, and means for raising and lowering said standard.

13. The combination with a plurality of seaming units traveling in a circular path, each seaming unit including a chuck, a lever pivoted intermediate its ends, a first-operation seaming roll at one end of said lever, and a second-operation seaming roll at the other end of said lever, a stationary circular cam, a roller carried by the seaming lever and engaging said stationary cam for oscillating the same to move the first-operation roll into engagement with the parts to be seamed, a stationary yielding circular cam, and a roller carried by said seaming lever cooperating with said yielding circular cam for oscillating the lever to move the second-operation roll into contact with the parts to be seamed.

14. The combination with a plurality of seaming units traveling in a circular path, each seaming unit including a chuck, a lever pivoted intermediate its ends, a first-operation seaming roll at one end of said lever and a second-operation seaming roll at the other end of said lever, a stationary circular cam, a roller carried by the seaming lever and engaging said stationary cam for oscillating the same to move the first-operation roll into engagement with the parts to be seamed, a stationary yielding circular cam, a roller carried by said seaming lever cooperating with said yielding circular cam for oscillating the lever to move the second-operation roll into contact with the parts to be seamed, and means whereby the positions of the seaming rolls on the seaming lever may be shifted.

15. The combination of a main frame, a lower turret mounted in said main frame, an upper turret mounted in said frame, means for rotating said turrets, said upper turret having a plurality of seaming units, said lower turret having a support for a can body associated with each seaming unit, a cam track for raising the support to lift a can thereon into the seaming unit, said cam track having a depressible section, whereby the machine may be stopped at a predetermined point and the track lowered so as to remove the can from the seaming unit, said depressible section being positioned so that the can may be removed from the machine between the first and second seaming operations thereon.

16. The combination of a frame, a lower turret mounted therein, an upper turret mounted in said frame, means for rotating said turrets, seaming units carried by said upper turret, a support for the cans associated with each seaming unit and carried by the lower turret, said support including a cylindrical body portion, a plate mounted thereon for rotation, means for yieldingly

supporting said plate on said body portion, and means for raising said cylindrical body portion to lift the can thereon into the seaming unit.

5 17. The combination of a supporting frame, upper and lower rotating turrets mounted therein; means for connecting said turrets for positive rotation, a main driving shaft at the upper end of said frame, a central vertical shaft operated thereby, a gear rotating
10 with said shaft, a counter-shaft operated by said gear and connected to said upper turret for rotating the same, a plurality of seaming units mounted in said upper turret, each
15 seaming unit including a chuck, a spindle carrying said chuck, a gear on said spindle, and a gear on the vertical shaft adapted to mesh with the gears on the chuck spindles for rotating the same.

20 In testimony whereof, I affix my signature.
JOHN COYLE.

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