No. 812,285. PATENTED FEB. 13, 1906.

J. H. McELROY.

LOCKED SEAM CAN BODY MACHINE.

APPLICATION FILED APR. 7, 1902.

6 SHEETS—SHEET 1.

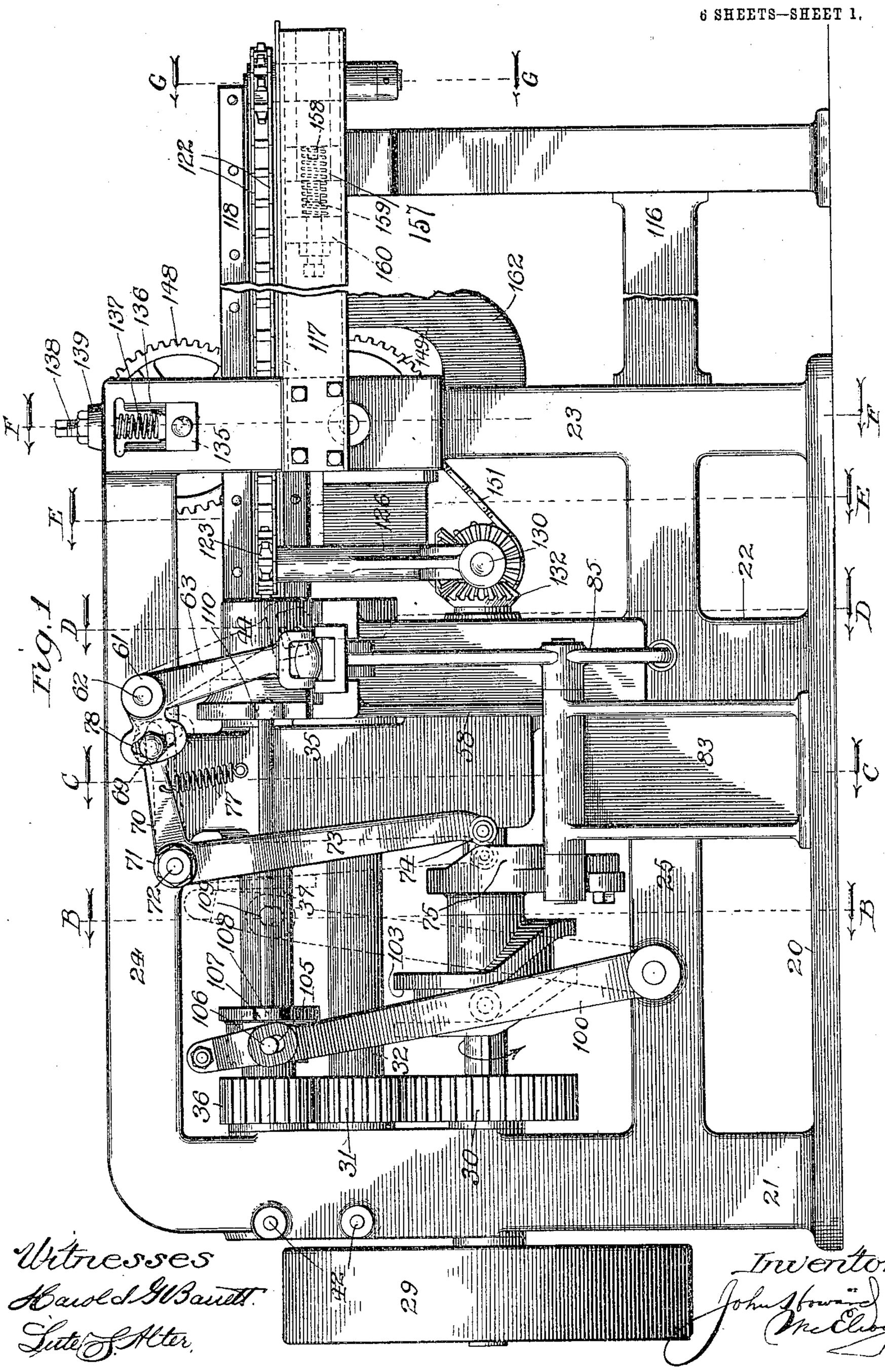

Fig. 1

Witnesses
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6 SHEETS—SHEET 2.

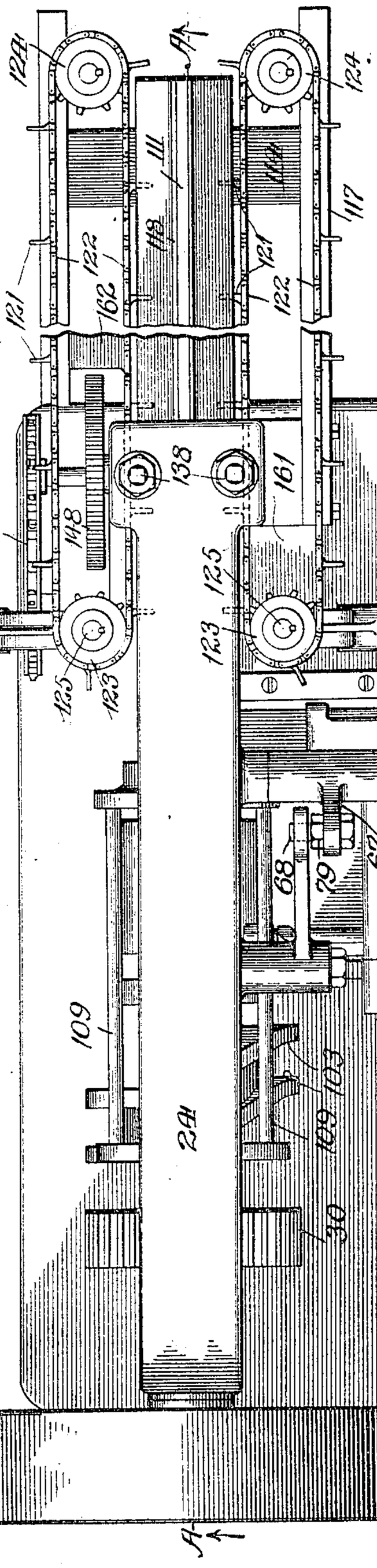

Fig. 2.

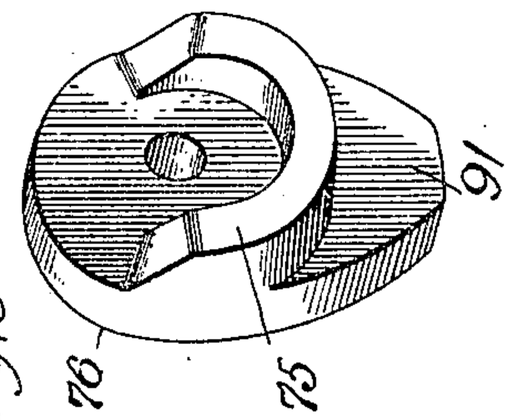

Fig. 3

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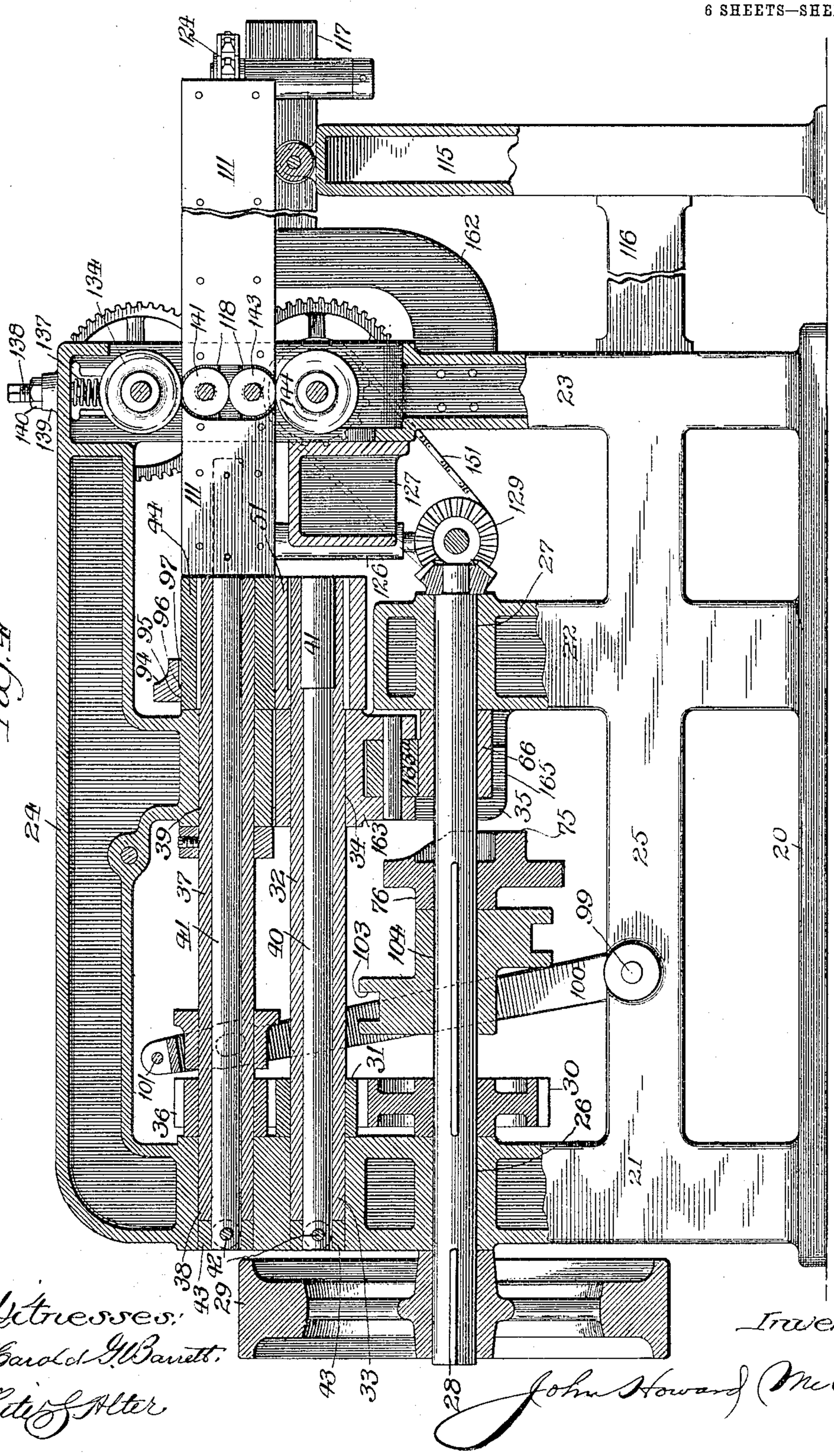
6 SHEETS—SHEET 3.

FIG. 4



Witnesses:
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6 SHEETS—SHEET 4.

FIG. 5

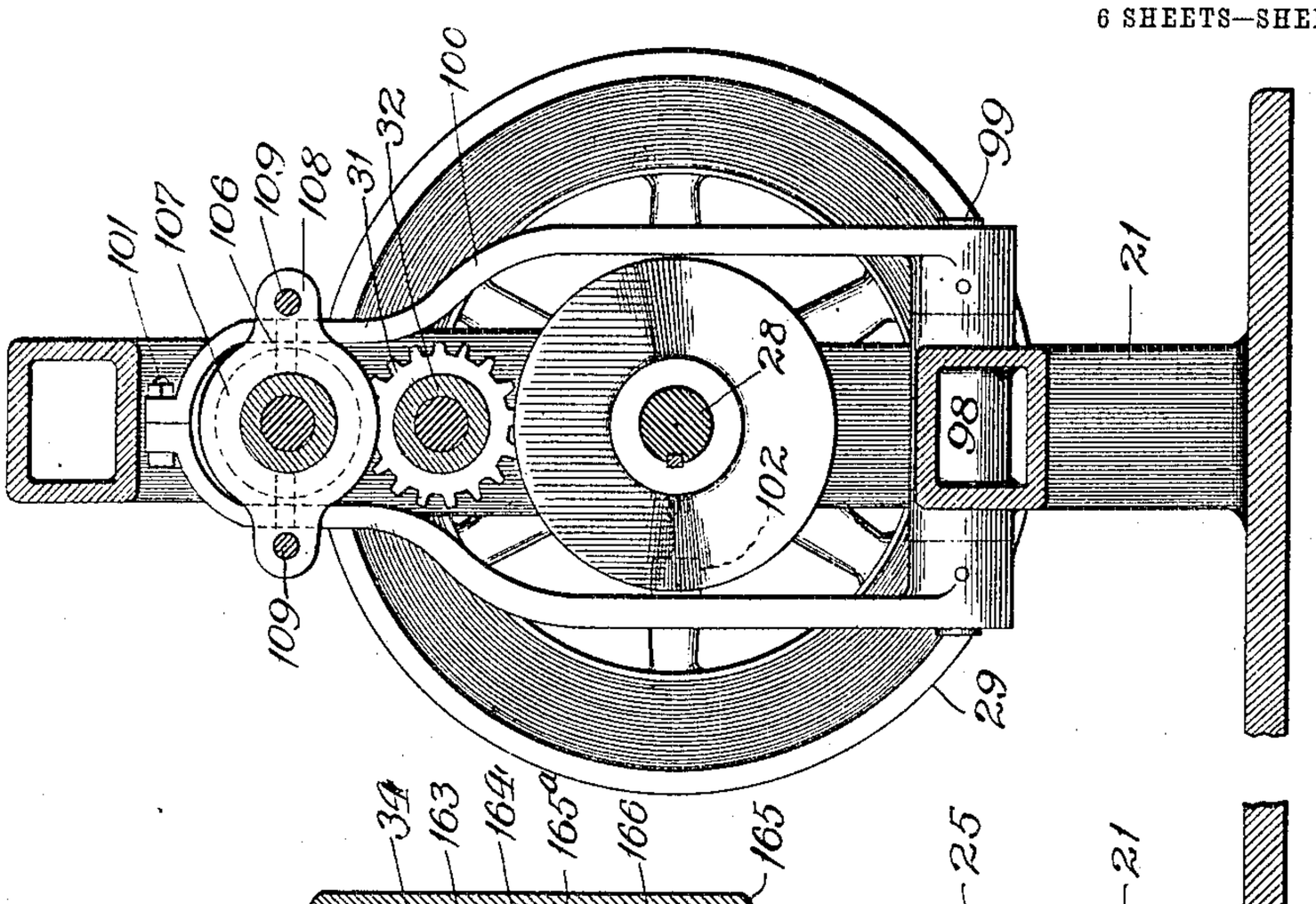


FIG. 6

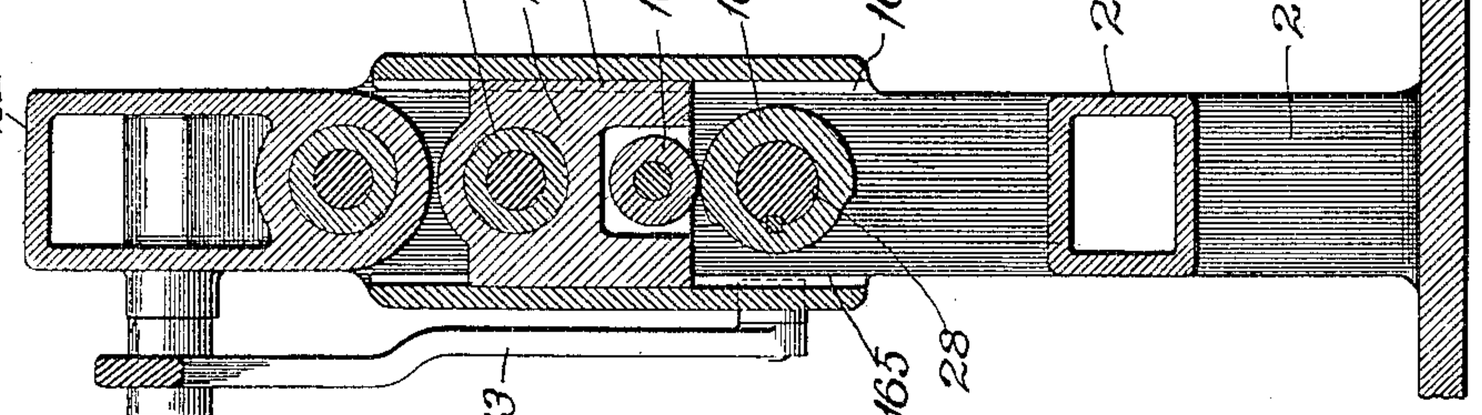
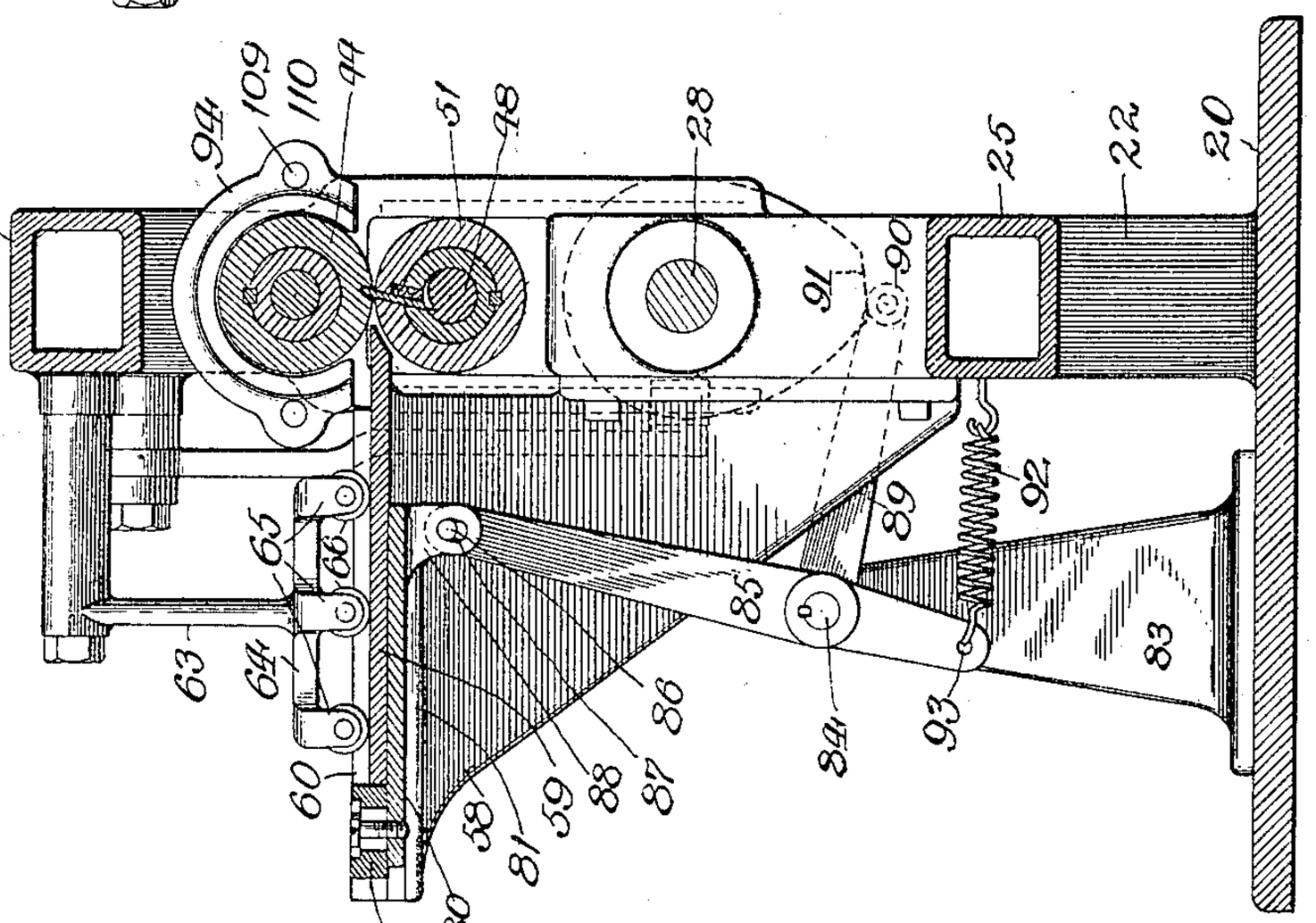


FIG. 7



Witnesses:
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LOCKED SEAM CAN BODY MACHINE.

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6 SHEETS—SHEET 5.

Fig. 8.

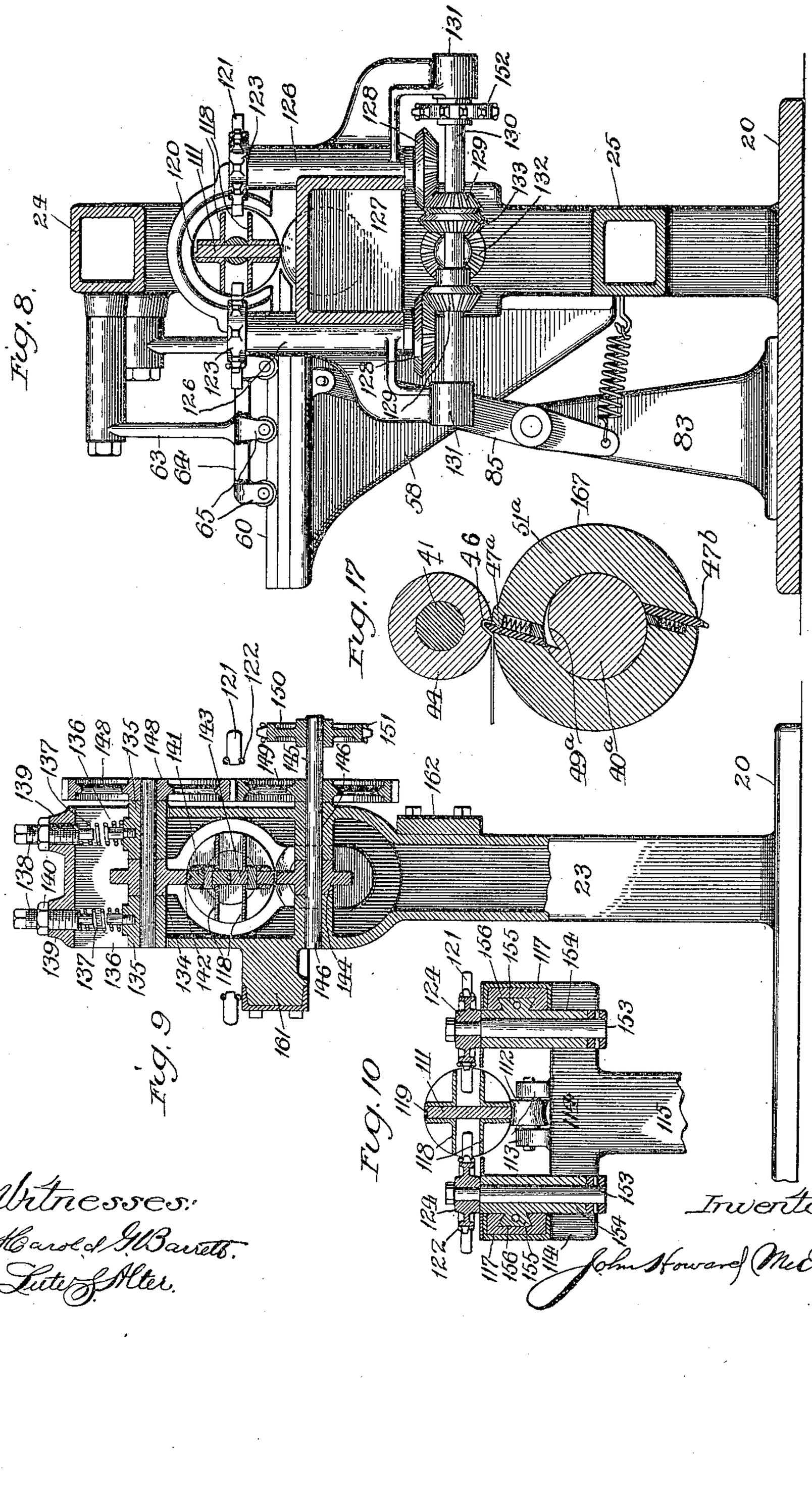

Fig. 9.

Fig. 17

Fig. 10

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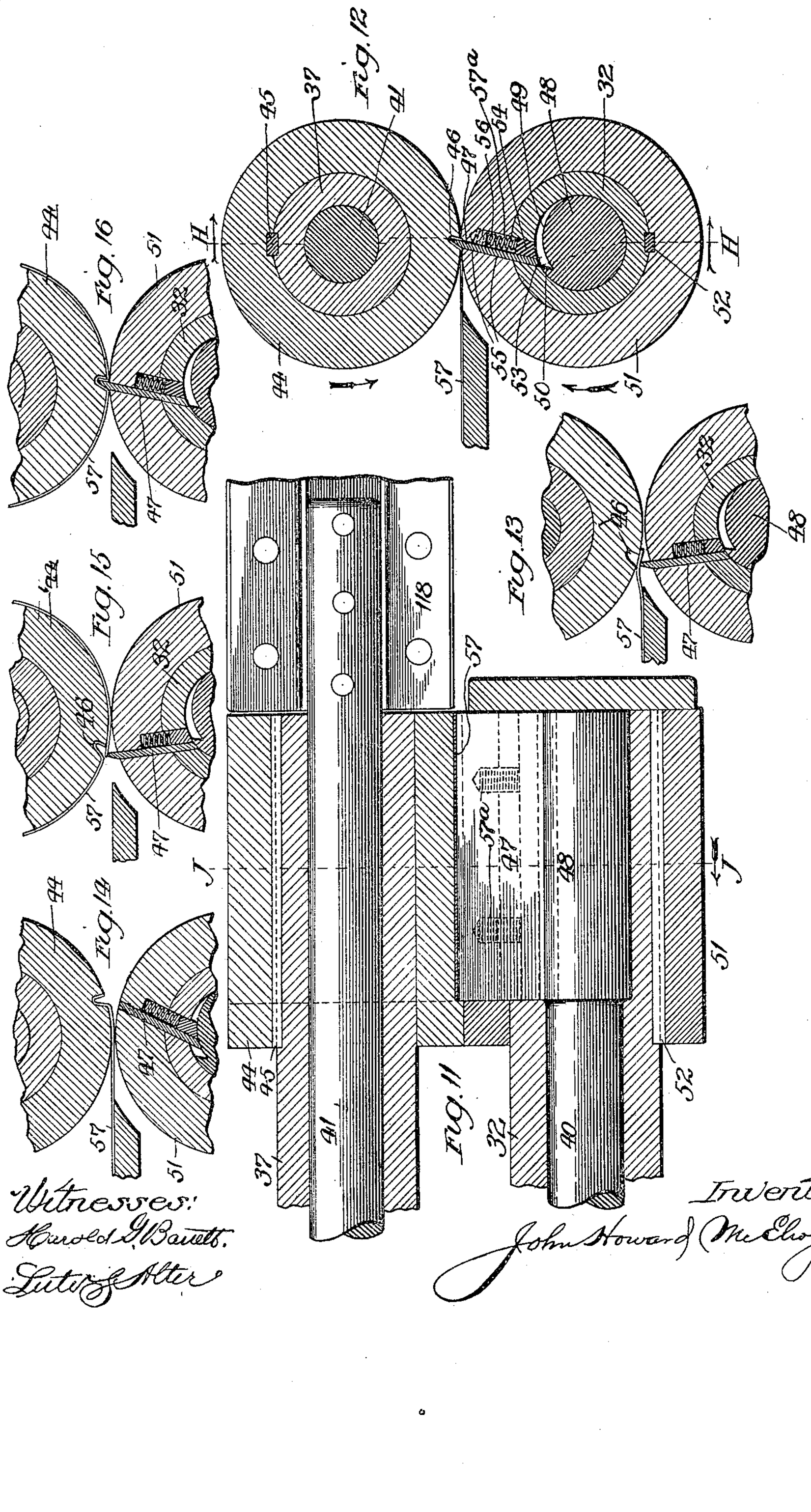
6 SHEETS—SHEET 6.



Witnesses:
Harold G. Bailey.
Luther S. Alter

Inventor:
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UNITED STATES PATENT OFFICE.

JOHN HOWARD McELROY, OF CHICAGO, ILLINOIS.

LOCKED-SEAM CAN-BODY MACHINE.

No. 812,285. Specification of Letters Patent. Patented Feb. 13, 1906.

Application filed April 7, 1902. Serial No. 101,838.

To all whom it may concern:

Be it known that I, JOHN HOWARD McELROY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Locked-Seam Can-Body Machines, of which the following is a specification.

My invention is concerned with a new and improved machine for making the locked-seam bodies of the ordinary cylindrical cans, and is designed to produce a machine of the class described which shall be simple in its construction and capable of operating rapidly with the employment of but little power.

To illustrate my invention, I annex hereto six sheets of drawings, in which the same reference characters are used to designate identical parts in all the figures, of which—

Figure 1 is a side elevation of the complete machine with a portion of the supplemental frame for carrying the soldering apparatus broken away. Fig. 2 is a plan view of the same. Fig. 3 is a perspective view of the double cam which controls the operation of the blank-feeding mechanism. Fig. 4 is a central longitudinal section on the line A A of Fig. 2. Figs. 5, 6, 7, 8, 9, and 10 are vertical sections on the lines B B, C C, D D, E E, F F, and G G, respectively, of Fig. 1. Fig. 11 is an enlarged detail in section on the line H H of Fig. 12. Fig. 12 is a vertical section on the line J J of Fig. 11. Figs. 13, 14, 15, and 16 are fragmentary details of the central portion of the mechanism shown in section in Fig. 12 on the same section-line, but with the parts in the different positions that they assume in the different stages of rolling the can-body; and Fig. 17 is a view similar to Fig. 12, but on a smaller scale, showing a modification.

The main portion of the framework of the machine consists of the base-plate 20, from which rise three pillars 21, 22, and 23, which are preferably connected by the top cross-piece 24 and the lower cross-piece 25. Journaled in the bearings 26 and 27 in the pillars 21 and 22, respectively, is the time-shaft 28, which is rotated by any suitable means, such as a belt, applied to the pulley-wheel 29, secured on the outer end thereof. The time-shaft 28 has secured thereon just inside of the bearing 26 the gear-wheel 30, which meshes with a gear wheel or pinion 31 of half its diameter, which is secured to the sleeve 32, which is mounted to rotate in the bearings 33 and 34, formed in the pillars 21 and 22, respectively. The bearing 34 for reasons to be hereinafter explained is preferably capable of a slight vertical movement in the offset portion 35 of the pillar 22, in which it is mounted. The gear-pinion 31 meshes with another gear-pinion 36 of exactly the same size, which is secured on the sleeve 37, which is mounted to rotate in the bearings 38 and 39, formed in the pillar 21, and the offset portion 35 of the pillar 22, respectively. These three shafts, or rather two sleeves and shaft, are in the same vertical plane, and it will be apparent that as the time-shaft 28 is given one complete rotation both of the sleeves 32 and 37 will be given two complete rotations. These sleeves 32 and 37 have located in the center thereof the rods or stationary shafts 40 and 41, respectively, each of which is conveniently secured from turning by the pins 42, passed through the outer end of the bearings 33 and 38, through the spacing-collars 43, which surround the ends of the rods and fill the end of the bearing-aperture, and finally through the rods themselves, so that they are held rigidly from movement despite the rotation of the sleeves 32 and 37 thereon.

The portion of the machine which does the actual work of rolling the flat blank of sheet metal into the cylindrical shape and forming the hooks is shown in enlarged detail in Figs. 11 to 16. On the outer end of the sleeve 37 I secure the sleeve 44, which constitutes an enlargement of the sleeve and might be formed integrally therewith, but which is preferably formed separately and secured thereto by the spline 45. This cylinder is substantially equal to the interior diameter of the can which it is adapted to form and has extending longitudinally thereof the seaming-groove 46, which is set at a slight angle to the radial line at that point and is of sufficient depth and width to accommodate the hooks forming the seam and the tucking-blade 47, which is mounted and supported in the manner to be described. The outer end of the rod 40 is preferably slightly enlarged and has formed therein the cam-recess 49, which has one side 50 thereof set at the same angle to the perpendicular that the seaming-groove 46 assumes when it is directly underneath the axis of the roller in which it is formed. The tucking-blade 47 is set at the same angle in the cylinder 51, secured upon the outer end of the sleeve 32, preferably by means of the spline 52. This cylinder is of the same diameter as

the companion cylinder 44, with which it co-operates. The other side of the cam-recess 49 is on a curve and slopes gently to the point where it runs into the surface of the cylinder 48 in which it is formed. The tucking-blade 47 has the bearing-surface 53 on its inner end, which is preferably cruved on the same arc as the periphery of the cylinder 48, upon which it rides during the greater part of each revolution of the sleeve 51, in which it is mounted. It has an offset portion 54 on one side thereof, which prevents it from escaping from the cylinder, inasmuch as the groove 55 in the cylinder 51, in which it plays, is of just sufficient width near the outer surface of the sleeve to receive the tucking-blade itself; but the inner portion of the recess is widened, as seen, and the shoulder 56 is formed between the two portions. Two or more helically-coiled expanding-springs are preferably interposed between the shoulder 56 and the offset portion 54 of the tucking-blade, their ends being conveniently confined in circular recesses 57[a]. (Shown in dotted lines in Figs. 11 and 12.) These springs serve to draw the tucking-blade out of the seaming-recess as soon as the hook formed on the end of the blank 57 is completely inserted in the groove 46, the spring, however, being held from acting until this occurs, as seen in Fig. 12, by reason of the bearing-surface 53 being sustained upon the periphery of the cylinder 48. At the instant that the seam is tucked in completely the surface 53 passes over the shoulder formed by the periphery of the cylinder 48 and the side 50 of the cam-recess 49, and the spring is then allowed to act and force the tucking-blade into the position shown in Fig. 14. This retreat of the tucking-blade is necessary to permit the continued rotation of the parts past the position shown in Fig. 12 without breaking them.

The general operation of this mechanism in forming the can-body will now be apparent from the sectional views shown in Figs. 12 to 16. In Fig. 13 the blank 57, which is fed into position accurately by the mechanism to be described, is in position to have the tucking-blade strike it at just the right point to force enough of the end of the blank into the groove 46 as the rotation continues to make the hook shown in section in Fig. 12, where the hook is represented as completely formed. At this instant the tucking-blade passes over the shoulder and is allowed to retreat or be forced out as the rotation continues to the position shown in Fig. 14. The hook is tucked into the groove 46 tightly enough to hold it there, and as the rotation of the cylinders 44 and 51 is continued the blank 57 is rolled in a cylindrical form about the cylinder 44 until it reaches the position shown in Fig. 15, where it will be seen that just enough of the end of the sheet stands over the groove 46, with the previously-formed hook therein, to form the other hook as the tucking-blade is once more forced into the groove, where the seam is formed, as shown in Fig. 16, where it will be seen to be hooked sufficiently to permit the can-body thus formed to be shoved off of the cylinder 44 and passed to mechanism which flattens it and presses the seam tight. It will be apparent that a can-body is formed at each second rotation of the cylinders and that while one can-body is being formed and discharged the blank for another one can be placed upon the receiving-table in position to be moved by automatic mechanism to be subsequently described exactly to the position to be properly grasped by the cylinders after the first can-body has been formed and discharged.

Referring now especially to Figs. 1, 2, 7, and 8, it will be seen that as a support for the blank I secure to the side of the main portion of the pillar 22 a bracket 58, which carries the horizontal table 59, on which the can-blank is placed. An upwardly-projecting stop-flange 60, whose operative edge is exactly at right angles to the axis of the forming-cylinders, serves as an edge-guide for the blank, which is placed against it by hand or any suitable automatic mechanism. To insure the blank being placed and held squarely against the edge-guide, I employ a bell-crank lever 61, pivoted to a pin 62, projecting from the top cross-piece 24. The arm 63 of the bell-crank extends downward, as shown, and normally occupies the position shown in dotted lines in Fig. 1. At its lower end I form a yoke 64, which has a plurality of forks 65, preferably three in number, which have journaled therein the antifriction-rollers 66, which are preferably slightly rounded on their longitudinal surfaces and are surfaced with some elastic or yielding material, such as felt, soft rubber, &c. The other arm 67 has a pin 68 projecting therefrom and engaging with the elongated slot 69 in the arm 70 of another bell-crank lever 71, which is pivoted on a pin 72, projecting from the cross-piece 24. The other arm 73 is extended down, as shown, and is provided with an antifriction-roller 74, which coöperates with the face cam-flange 75, formed on the cam 76, which is shown detached and in perspective in Fig. 3. A helically-coiled contractile spring 77, secured to the arm 70 and to the offset portion 35 of the pillar 22, serves to hold the antifriction-roller 74 against its coöperating cam-flange and to hold the bell-crank lever 61 normally in the elevated position shown in dotted lines in Fig. 1. During the operation of the machine after the blank has been placed on the table 59 and just prior to the movement of the feeding mechanism to be described the cam-flange 75, contacting with the antifriction-roller 74, carries the parts to the position shown in full lines in Figs. 1, 7, and 8. As the rollers 66 swing down in the arc of a circle they strike the upper surface of the can-

blank, and if it is not squarely against the edge-guide 60 they serve to carry it against said edge-guide. When the blank is pushed in to be engaged by the forming-cylinders, the rollers bearing on the upper surface of the blank prevent its buckling under pressure or being accidentally displaced, while they do not offer any material resistance to the blank being pushed into position, where it is seized by the forming-cylinders. The cam-flange 75 may be so shaped as to permit the rollers 66 to be raised as soon as the blank is seized by the forming-cylinders, although they might be held down until the blank was drawn entirely from under them, except that this would unnecessarily shorten the time in which the next blank is put in position.

To adjust the exact position which the rollers 66 shall occupy, I preferably form the arm 67 of the bell-crank lever 61 with the segmental slot 78 therein, and the pin 68 is secured therein in any desired position of adjustment by means of the set-nuts 79, which, together with the head of the pin, serve to clamp it securely in any position that it may be placed in the slot.

To push the blank to the exact position it should occupy to be properly seized by the forming-cylinders, I employ the slide 80, which reciprocates in the ways 81, formed on the under side of the table 59. A stop-gage 82 is adjustably secured, as by the slot and set-screw shown in Fig. 7, to the rear end of the slide 80, so that it can be adjusted to contact with the rear end of the blank and carry its front end exactly into position to be gripped by the forming-cylinders. The rollers 66 being down when the blank is moved prevent any accidental overthrow resulting from the rapid movement of the slide and also prevent the blank from being displaced. To move the slide 80 forward positively, I journal in the standard 83 a rock-shaft 84, which has the vertical arm 85, constituting one member of a bell-crank lever, provided with a pin 86, taking into the elongated slots 87, formed in the ears 88, projecting downward from the under side of the slide. On the other end of the rock-shaft is secured the arm 89, constituting the other member of the bell-crank lever, which is provided with the antifriction-roller 90, which serves to coöperate with the cam-lug 91, formed on the periphery of the compound cam 76. It will be seen that as the cam rotates the cam-lug 91 will carry the slide positively from a position to the left of that shown in Fig. 7 to the position there shown, in which the blank 57 is held with its forward edge in the position shown in Fig. 13. As soon as the cam-lug is passed a helically-coiled retractile spring 92, secured to the lower cross-piece 25 and to the arm 93, constituting the lower end of the lever 85, pulls the slide 80 back to its normal position ready for the insertion of a fresh blank, when the rollers 66 are raised and the previous blank is out of the way. By placing the two cams for controlling the positioning mechanism and the feeding mechanism on the same disk there is no possibility of the timing of the parts becoming disarranged.

To discharge the can-body from the forming-cylinder 44, I employ the mutilated collar 94, the shape of which in cross-section is shown in Fig. 4. This collar extends around about two hundred and seventy degrees of the upper portion of the cylinder and is slid back and forth thereon by the mechanism to be described. Its rear inner periphery 95 rests snugly enough against the surface of the cylinder so that the can which has been rolled around the cylinder is caught by the square shoulder 96, which separates the inner peripheral portion 95 from the larger inner peripheral portion 97. To reciprocate this discharge-collar at the proper time, I journal, in the bearing 98, formed in the cross-piece 25, a rock-shaft 99, which has the two arms 100 extending upwardly therefrom and their upper ends united, as by the bolt 101, the outline of the arms 100 being that which is necessary to accommodate them to the parts past which they swing. One of the arms is provided with the antifriction-roller 102, which projects into the cam-groove 103, formed in the cam-disk 104, secured on the shaft 28 between the gear-wheel 30 and the cam-disk 76. The arms 100 have the slightly-elongated slots 105 formed therein in the plane of the bar 41, into which project pins 106, extending from either side of a collar 107, mounted to reciprocate on the sleeve 37 from the full-line position of Fig. 1 to the dotted-line position. This collar 107 has the ears 108 projecting from either side thereof, and the rods 109, secured in these ears and extending forward and secured in the ears 110 of the discharging-collar 94, serve to carry the discharging-collar 94 forward with the collar 107 as it is operated by the cam 104.

While I might employ other mechanism for pressing the seam of the can thus formed, I preferably employ the mechanism shown in Figs. 1, 2, and 9. The bar 41 is employed for the purpose of being connected to the bar 111, as best shown in Fig. 11, the end of the bar 41 being slotted to receive the bar 111, which is riveted or bolted thereto. The bar 111 extends to the outer end of the machine, where it rests on the roller 112, which is mounted in bearings 113, secured upon the cross-piece 114 of the auxiliary pillar or standard 115, which is preferably connected to the pillar 23 by the lower cross-piece 116 and by the channel-irons 117 to be hereinafter more fully described. The bar 111 is built out to form additional peripheral supports for the can-bodies moved thereover by securing the four angle-irons 118, as shown in section in Figs. 8 and 9 and in side elevation in

Fig. 4. The bar 111 has formed in the center of the top thereof the small channel 119, which is of a size to just receive the seam of the can-body as it is carried along the bar by the chains hereinafter described. In the portion of the bar 111 in advance of the seam-pressing rolls to be described the side of the channel 119, upon which the seam of the can which is rotating as it is discharged enters, is cut away, as seen at 120 in Fig. 8. The movement of the discharge mechanism is so timed that as the can clears the cylinder 45 its inwardly-projecting seam contacts with the shoulder formed by that portion of the bar adjacent to the groove 119 which is not cut away. Shortly after the can-body is discharged onto the bar 111 it is taken hold of by the fingers 121, projecting at suitable intervals from the links of the sprocket-chains 122, which coöperate with the sprocket-wheels 123 at their inner ends and with the sprocket-wheels 124 at their outer ends. The sprocket-wheels 123 are secured upon the vertical shafts 125, mounted in the vertical bearings 126, formed in the bracket 127, projecting rearwardly from the standard or pillar 23 just beneath the bar 111. These shafts 125 have the bevel gear-wheels 128 secured on the lower ends thereof and meshing with the bevel gear-pinions 129, secured upon the horizontal shaft 130, mounted in the bearings 131, formed on the yoke-like lower portion of the bracket 127 in the same vertical plane as the bearings 126. A bevel-gear 132, secured upon the inner end of the shaft 28, meshes with a bevel-gear 133, also secured on the shaft 130. The arrangement of the gears, sprocket-wheels, and chains is such that a pair of the fingers 121 pass the bar 111 at each rotation of the shaft 28, so that the can-bodies are carried thereby along the bar 111 as fast as they are formed by the machine and discharged thereon.

To flatten and press the seam formed by the cylinders 44 and 51, I preferably carry the can beneath a roller 134, which is mounted to rotate in the preferably sliding spring-pressed bearings 135, mounted to yield vertically and move in the ways 136, formed in the upper portion of the standard 23. A pair of strong helically-coiled expanding-springs 137 are interposed between the tops of the bearings 135 and the bottoms of the set-screws 138, which are screwed through the threaded projections 139, formed in the top of the cross-piece 24 and held in position by the set-nuts 140. By means of adjusting these set-screws the amount of pressure which may be desired can be employed upon the bearings. Just beneath the roller 134 the bar 111 is cut away; but the angle-irons 118, secured on either side thereof, serve to continue it practically uninterrupted. The angle-irons have journaled therein the coöperating roller 141, which has the peripheral channel 142 therein of the proper size to just receive the pressed seam therein. I preferably employ in connection with the roller 141 a companion roller 143, which is of the same size and rotates in the opposite direction. The general cross-section of the peripheries of these rollers is curved on the same radius as the can-body, and beneath the roller 143 I mount a roller 144 of the same size as the roller 134; but its shaft 145 instead of being mounted in movable bearings is mounted in the stationary bearings 146. With the construction herein shown and described it will be apparent that the pressure of the roller 134 is transmitted through the rollers 141 and 143 to the roller 144, which is mounted in stationary bearings, so that the strain is taken off of the bar 111. This arrangement of having the can pressed at the top and the bottom simultaneously serves to prevent the tendency to curl the can, which exists if it is pressed only on one side. I preferably elongate slightly the bearings in the angle-irons 118 in which the shafts of the rollers 141 and 143 are mounted, so that they will accommodate themselves to the variations in pressure without putting any strains on their bearings, the strain being taken by the long bearings 146 of the shaft 145. While I might depend on the chains 122 to carry the cans between these seam-pressing rollers, I preferably carry the cans through positively by means of moving the rollers positively, so as to prevent any tendency of the fingers to jam the rear edges of the can on account of the pressure required to force it between the rollers. For this purpose I secure the gear-wheels 148 and 149 on the ends of the shafts of the rollers 134 and 144, respectively, these gear-wheels intermeshing and having teeth long enough to permit the slight separating movement caused by the shifting of the position of the bearings 135. On the outer end of the shaft 145 I place the sprocket-wheel 150, which has the sprocket-chain 151 thereon, which passes over the sprocket-wheel 152, secured on the shaft 130. I preferably gear these wheels 148 and 149 to move at a rate that will carry the can through the pressing-rollers when once it has been gripped thereby at a slightly greater speed than the chains 122 carry them through, so that it is impossible for the fingers 121 to indent the rear edges of the cans if the slack in the chain 151 or any other portion of the driving mechanism should cause the rollers to vary in their speed of movement.

The sprocket-wheels 124 are secured upon the shafts 153, which are mounted in the bearing-sleeves 154, which have the dovetail members 155, sliding in the correspondingly-shaped ways 156, formed in the brackets secured in the inner surfaces of the channel-bars 117, which rest on the cross-piece of the auxiliary standard 115. A helically-coiled

expanding spring 157, interposed between a pin 158 on the end of the sliding bearing-block 155 and a set-screw 159, screwed through the stationary block 160 on the inside of the channel-bar 117, serves to hold the bearings yieldingly in position to keep the chain taut. The channel-bars 117 are in position to support the chain on one side and are supported at their inner ends on the lug 161 on one side of the standard 23 and the bracket 162, projecting outwardly and upwardly from the other side, so as to support the channel-bar without interfering with the gear-wheels 148 and 149.

To prevent the contact of the two cylinders 44 and 51 from retarding the can-body as it is shoved off in the discharging movement, I preferably make the bearing 34 for the sleeve 32 movable by providing the block 163, in which it is formed, with the guide-ribs 164, which slide in the guideways 165, formed in the offset portion 35 of the standard 22. In the bottom of the block 163 I journal an antifriction-roller 165^a, and on the shaft beneath this roller I secure a cam-disk 166, which has enough of its surface slightly raised above the smaller portion to hold the cylinder 51 in contact with the cylinder 44 while the can-body is being rolled thereon, while permitting the cylinder 51 to drop a very small fraction of an inch—say a thirty-secondth—while the can is being shoved off.

In Fig. 17 I have shown a small sectional view of a slightly-modified form of my invention. In this form the cylinder 44 is constructed the same as in the other form; but the cylinder 51^a is made of twice the diameter of the cylinder 44, and the stationary central portion 40^a is preferably increased in diameter in a corresponding manner. Instead of having one tucking-blade 47 I provide two of them, 47^a and 47^b, located diametrically opposite each other, but otherwise constructed and coöperating in the same manner with the cam-groove 49^a. The tucking-blade 47^a, which coöperates with the seaming-groove 46 to form the first hook, has its operative edge large enough to fill the seam completely when the single hook is forced in. The tucking-blade 47^b serves to push the second hook into the seaming-groove within the other hook and has its operating edge thinner by an amount equal to the thickness of the sheet of tin, so that the fit of the tucking-blade in the seaming-groove will be perfect in both cases. Another advantage of this construction is that that portion 167 which would contact with the cylinder 44 when the can is being shoved off can be reduced, as shown, so that it does not contact with it, and thus the bearing 34 can be made rigid and not movable.

The operation of the complete machine will be readily apparent from the description which has been given of the various combinations of elements of which it consists. After the can-body has been formed, its seam pressed, and as it is being carried along the bar 111 by the chains 122 the seam is fluxed in any suitable manner and then soldered by any suitable mechanism—such, for instance, as that shown in Patent No. 598,567, February 8, 1898. The fluxing mechanism, the soldering mechanism, and any wiping and cooling mechanism that may be employed can be readily located on the channel-bars 117, which may be extended any distance that may be desired for this purpose.

While I have shown my invention as embodied in the form which I at present consider best adapted to carry out its purposes, it will be understood that it is capable of wide modifications and that some of the mechanisms for the various steps in making the can may be used in connection with different combinations for carrying out the other steps of the process. Consequently I do not desire to be limited in the interpretation of the following claims by the exact structure herein shown and described, but only so much as may be necessitated by the state of the prior art.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a device of the class described, the combination with the roller having the seaming-groove therein, of the coöperating roller having the tucking-blade slidingly mounted therein and coöperating with the groove, a stationary member coöperating with the said blade to control the sliding movement thereof as its roller rotates and means for rotating said rollers.

2. In a device of the class described, the combination with the roller having the seaming-groove therein, of the coöperating roller having the tucking-blade slidingly mounted therein and coöperating with the groove, means within the latter roller for holding the blade immovable relative to the roller carrying it until it has completely entered the groove and then releasing it so that it can be withdrawn, and means for rotating said rollers.

3. In a device of the class described, the combination with the roller having the seaming-groove therein, of the coöperating roller having the tucking-blade slidingly mounted therein and coöperating with the groove, means for holding the blade immovable relative to the roller carrying it until it has completely entered the groove and then releasing it so that it can be withdrawn, means for withdrawing the blade as soon as it is released, and means for rotating said rollers.

4. In a device of the class described, the combination with the roller having the seaming-groove therein, of the coöperating roller having the tucking-blade slidingly mounted therein and coöperating with the groove, means for holding the blade rigid until it has

completely entered the groove and then releasing it so that it can be withdrawn, said means consisting of a stationary central portion about which the second roller rotates, said central portion being provided with the cam-recess into which the tucking-blade can drop, and means for rotating said rollers.

5. In a device of the class described, the combination with the roller having the seaming-groove therein, of the coöperating roller having the tucking-blade slidingly mounted therein and coöperating with the groove, a stationary center about which the second roller rotates, said center being provided with the bearing-surface and cam-recess which holds the blade rigid until it has completely entered the groove and then releases it so that it can be withdrawn, a spring interposed between the blade and the second roller to withdraw the blade as soon as the cam-groove is reached, and means for rotating said rollers.

6. In a device of the class described, the combination with the roller having the seaming-groove therein, of the coöperating roller having the tucking-blade slidingly mounted therein at an acute angle to the line connecting the centers of the rollers, a stationary center about which the second roller rotates having the bearing-surface for the tucking-blade and the cam-recess into which it can drop when it has completely entered the seaming-groove, and means for rotating said rollers.

7. In a device of the class described, the combination with the roller having the seaming-groove therein, of the roller coöperating therewith having the tucking-blade engaging the seaming-groove, discharge mechanism coöperating with the first-mentioned roller, means for rotating said rollers, means for holding said rollers firmly in engagement while the can is being formed thereon, and means for releasing them when the can is being discharged.

8. In a device of the class described, the combination with the roller having the seaming-groove therein and making two complete revolutions at each operation, of the second roller coöperating therewith having the tucking-blade engaging the seaming-groove, a discharge mechanism coöperating with the first-mentioned roller, means for rotating said rollers, a movable bearing for said second-mentioned roller, and a cam coöperating with said bearing to hold said rollers firmly together as the can-body is formed thereon, and for releasing them when the can-body is discharged.

9. In a device of the class described, the combination with the roller having the seaming-groove therein, of the stationary center about which said roller rotates, the coöperating roller having the tucking-blade engaging the seaming-groove, a stationary can-support attached to said stationary center, mechanism for discharging a can-body upon said stationary support.

10. In a device of the class described, the combination with the roller having the seaming-groove therein, of the stationary center about which said roller rotates, the coöperating roller having the tucking-blade engaging the seaming-groove, a stationary can-support attached to said stationary center, mechanism for discharging a can-body upon said stationary support, and means for carrying a can along said support after it has been placed thereon by the discharge mechanism.

11. In a device of the class described, the combination with the roller having the seaming-groove therein, of the stationary center about which said roller rotates, the coöperating roller having the tucking-blade engaging the seaming-groove, a stationary soldering-bar attached to said stationary center, mechanism for discharging a can-body from the first roller onto the soldering-bar, means for carrying the can along said soldering-bar after it has been placed thereon by the discharge mechanism, and supports extending along the soldering-bar and adapted to support the soldering mechanism for soldering the side seam as the can is carried along the bar by said means.

12. In a device of the class described, the combination with the roller having the seaming-groove therein, of the stationary center about which said roller rotates, the coöperating roller having the tucking-blade engaging the seaming-groove, a stationary can-support attached to said stationary center, mechanism for discharging a can-body from the first-mentioned roller upon said stationary support, and mechanism for pressing the seam of the can-body.

13. In a device of the class described, the combination with the roller having the seaming-groove therein, of the stationary center about which said roller rotates, the coöperating roller having the tucking-blade engaging the seaming-groove, a stationary soldering-bar attached to said stationary center, mechanism for discharging a can-body from the first-mentioned roller upon said stationary soldering-bar, means for pressing the seam of the can-body, means for carrying the can along said soldering-bar after it has been placed thereon by the discharge mechanism, and stationary supports along said soldering-bar adapted to support soldering mechanism for soldering the side seam of the can as it is moved along the bar by said means.

14. In a device of the class described, the combination with the roller having the seaming-groove therein, of the stationary center about which said roller rotates, the coöperating roller having the tucking-blade engaging the seaming-groove, a stationary can-support attached to said stationary center,

mechanism for discharging a can-body upon said stationary support, and mechanism on said support for pressing the seam of the can-body.

15. In a device of the class described, the combination with the roller having the seaming-groove therein, of the stationary center about which said roller rotates, the coöperating roller having the tucking-blade engaging the seaming-groove, a stationary can-support attached to said stationary center, mechanism for discharging a can-body upon said stationary support, and mechanism on said support for pressing the seam of the can-body consisting of the roller within said support and the pressing-roller coöperating therewith.

16. In a device of the class described, the combination of the two rollers over which the can-body passes and with both of which it engages, with the pressing-roller engaging one of said first-mentioned rollers, a shaft to which it is secured, and a gear-wheel on said shaft, the supporting-roller opposed to the pressing-roller through the two first-mentioned rollers, the shaft upon which it is mounted and the gear-wheel on said shaft meshing with said first-mentioned gear-wheel, means for feeding the can-bodies past said rollers, and means for rotating said gears adapted to carry the can-bodies between the rollers faster than the feeding means moves them.

17. In a device of the class described, the combination of the two rollers over which the can-body passes and with both of which it engages, with the pressing-roller engaging one of said first-mentioned rollers, the supporting-roller opposed to the pressing-roller through the two first-mentioned rollers, and bearings for the three first-mentioned rollers permitting them to move in the line of the axes of the four rollers.

18. In a device of the class described, the combination of the two rollers over which the can-body passes and with both of which it engages, with the pressing-roller engaging one of said rollers, adjustable springs coöperating with the movable bearings for said pressing-roller, and means for feeding the can past said rollers.

19. In a device of the class described, the combination with the body-forming mechanism, of the blank-table from which the blanks are fed one by one to said mechanism, the feeding mechanism for the blanks, and a retarding device comprising a plurality of rollers adapted to be moved into engagement with the top of the blank before it is fed forward.

20. In a device of the class described, the combination with the body-forming mechanism, of the blank-table from which the blanks are fed one by one to said mechanism, the feeding mechanism for the blanks, an edge gage on the blank-table, and a retarding device adapted to be moved diagonally onto the top of the blank to carry its edge into engagement with the edge gage.

21. In a device of the class described, the combination with the body-forming mechanism, of the blank-table from which the blanks are fed one by one to said mechanism, an edge gage thereon, the feeding mechanism for the blanks, and a retarding and positioning device comprising a plurality of rollers adapted to be moved diagonally onto the top of the blank to carry its edge into engagement with the edge gage and to hold it down while operated upon by the feeding mechanism.

22. In a device of the class described, the combination with the body-forming mechanism, of the blank-table from which the blanks are fed one by one to said mechanism, the feeding mechanism for the blanks, a lever carrying a retarding device comprising a plurality of rollers adapted to be moved into engagement with the top of the blank before it is fed forward, and means for adjusting the limit of movement of the lever.

23. In a device of the class described, the combination with the body-forming mechanism, of the blank-table from which the blanks are fed one by one to said mechanism, the feeding mechanism for the blanks, a lever carrying a retarding device comprising a plurality of rollers adapted to be moved into engagement with the top of the blank before it is fed forward, and means for adjusting the limit of movement of the lever consisting of an adjustable pin carried by said lever and a slotted operating-lever coöperating with said pin.

24. In a device of the class described, the combination with the roller having the seaming-groove therein, of the coöperating roller having the tucking-blade engaging the seaming-groove, a blank-table upon which the blank is laid close to said rollers, a reciprocating feeding member engaging the blank, means for giving the feeding member a uniform movement, and an adjustable engaging face on said feeding member.

25. In a device of the class described, the combination with the roller having the seaming-groove therein, of the coöperating roller having the tucking-blade engaging the seaming-groove, a blank-table upon which the blank is laid close to said rollers, a feeding-slide engaging the blank, means for positively giving the slide a uniform movement to feed the blank, an adjustable engaging member on said slide, and a spring for returning said slide to normal position.

In witness whereof I have hereunto set my hand this 5th day of April, 1902.

JOHN HOWARD McELROY.

In presence of—

GEORGE R. HARBAUGH,

R. K. GUSTAFSON.