J. ELDRIDGE.

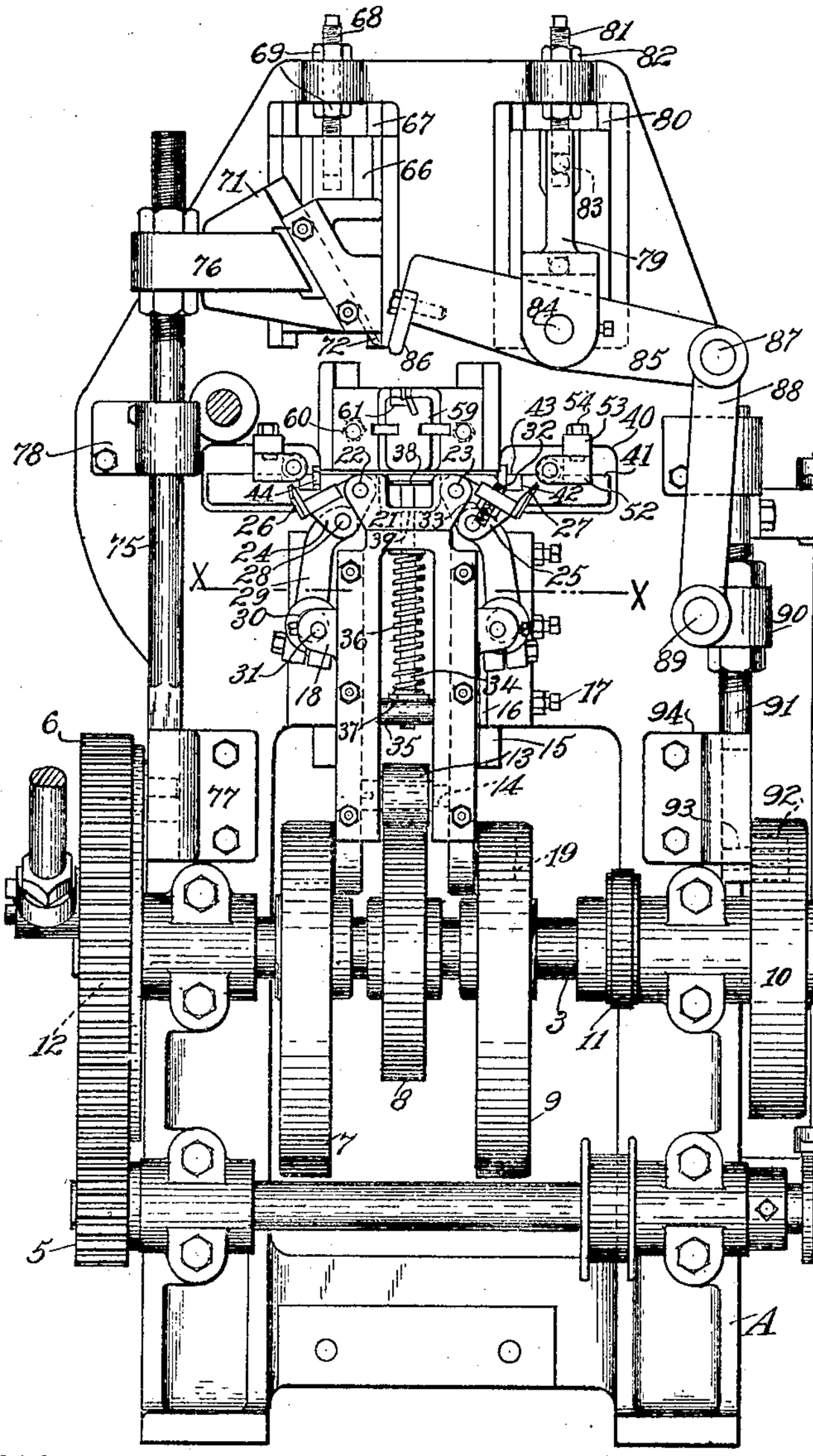
CAN BODY FORMING AND SOLDERING MACHINE.

APPLICATION FILED JAN. 16, 1906.

925,883. Patented June 22, 1909.

7 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

F. E. Maynard.

J. Sinus

Inventor:

John Eldridge

By Geo. H. Strong, atty

J. ELDRIDGE.

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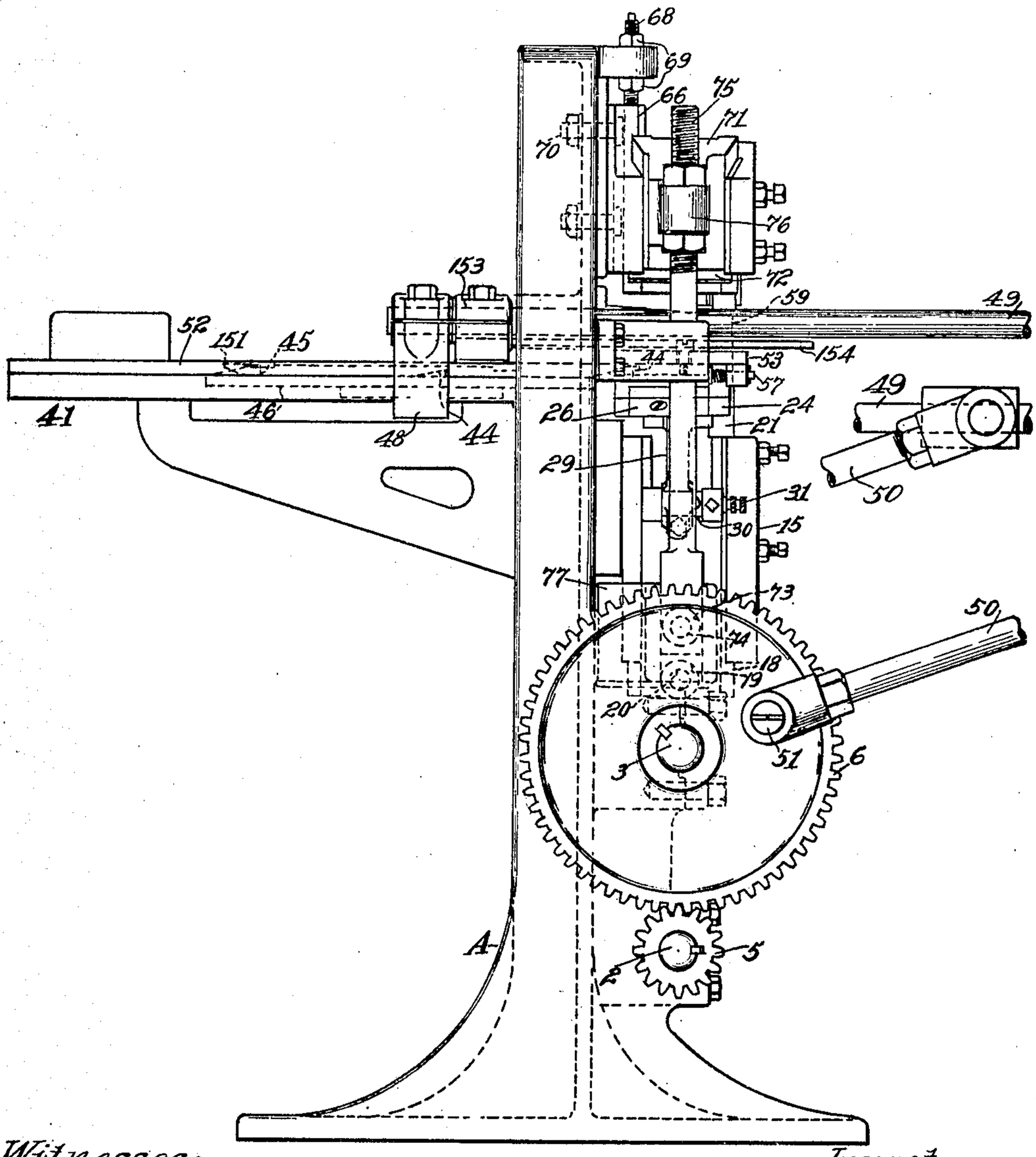
Fig. 2.



Witnesses:
F. E. Maynard.
L. Irvine

Inventor:
John Eldridge
By Geo. H. Strong.
Atty

J. ELDRIDGE.

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7 SHEETS--SHEET 3.

Fig. 3.

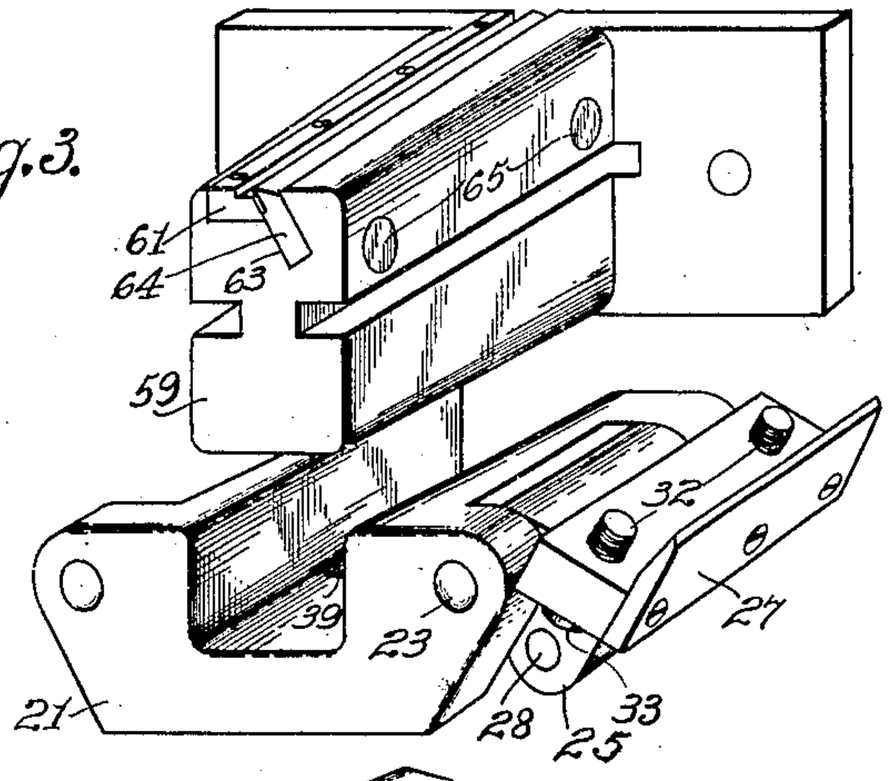


Fig. 6.

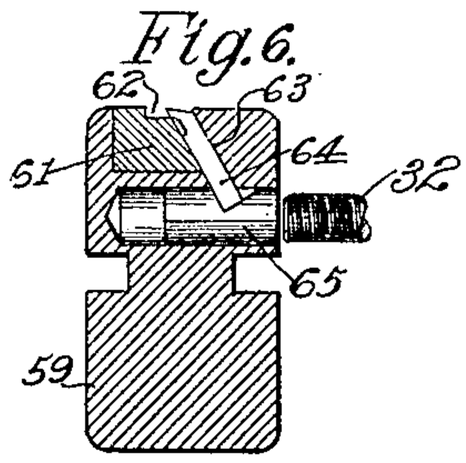


Fig. 18.

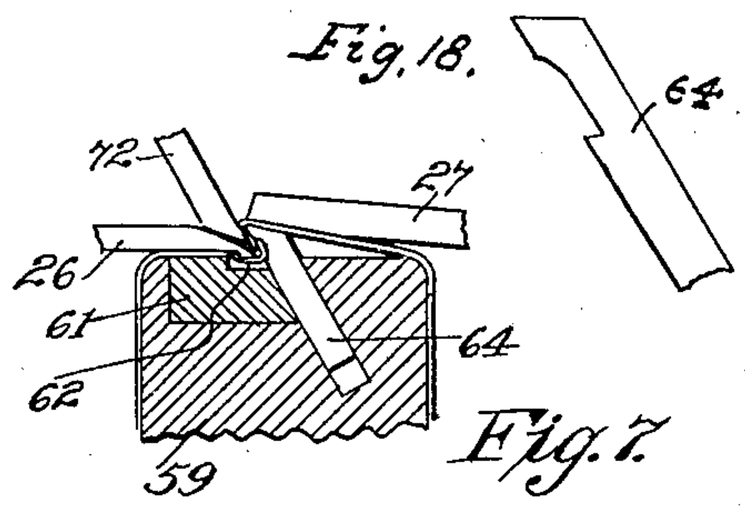


Fig. 7.

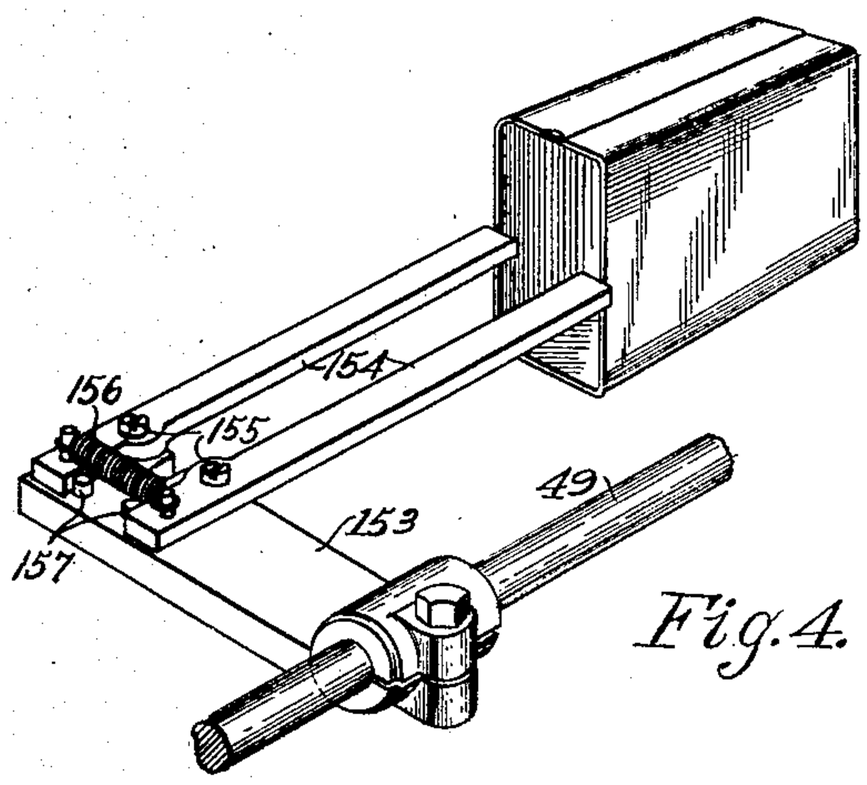


Fig. 4.

Fig. 12.

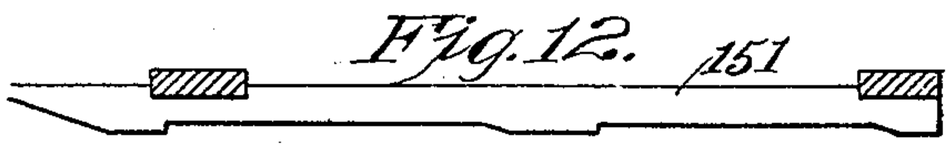


Fig. 5.

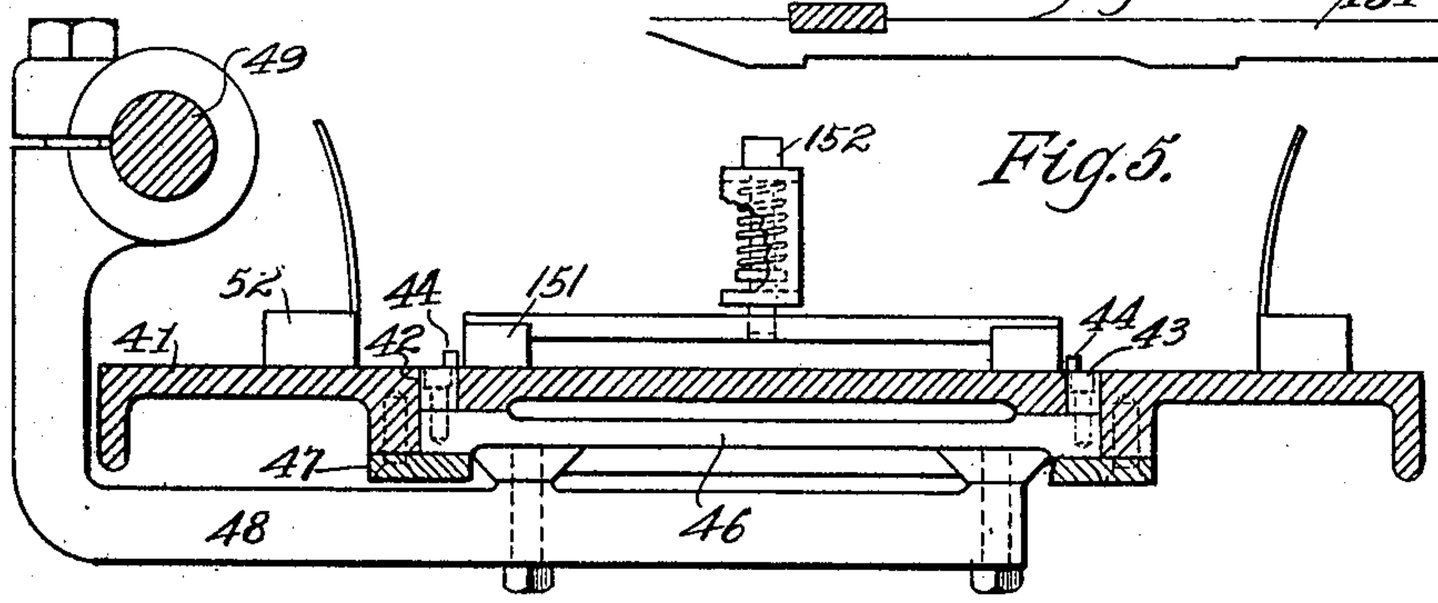
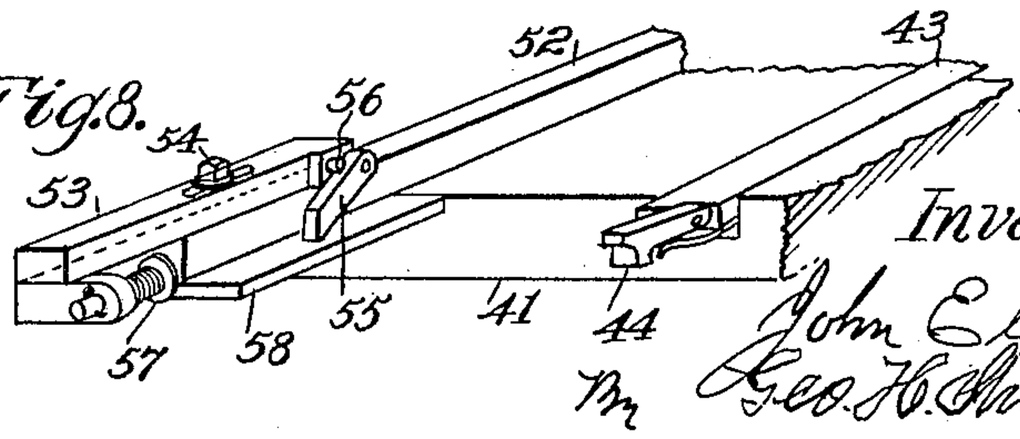


Fig. 8.



Witnesses:

F. E. Maynard.

J. L. Snee

Inventor:

John Eldridge

by Geo. H. Strong. Atty

J. ELDRIDGE.

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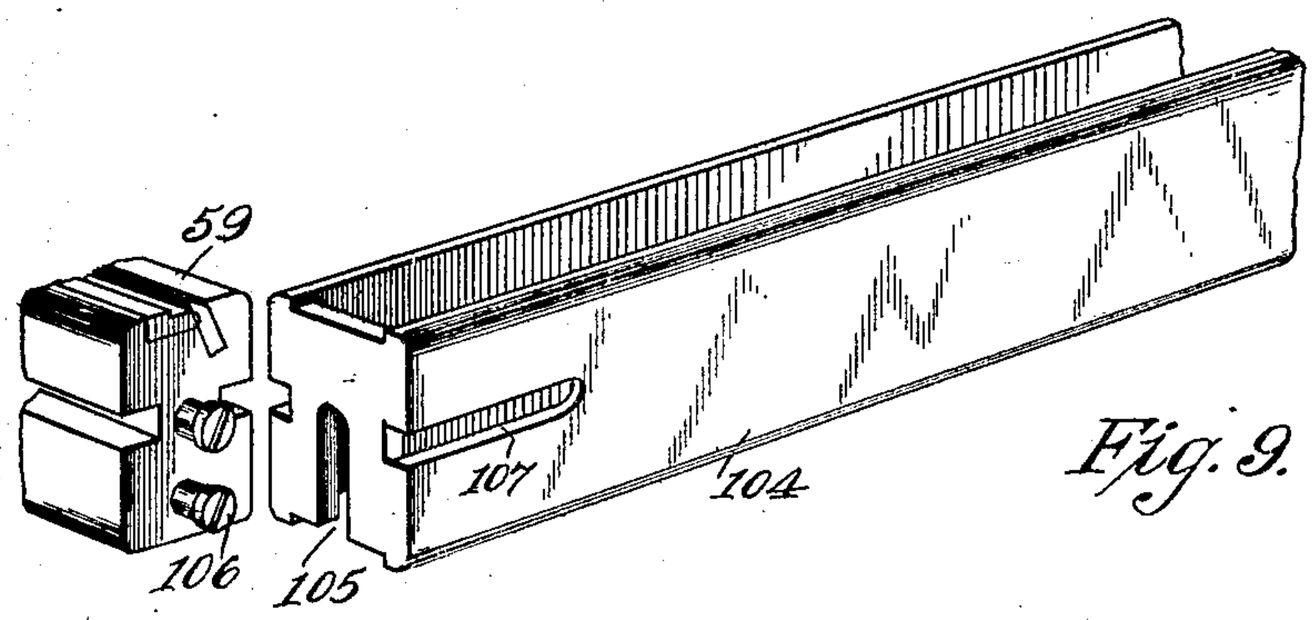

Fig. 9.

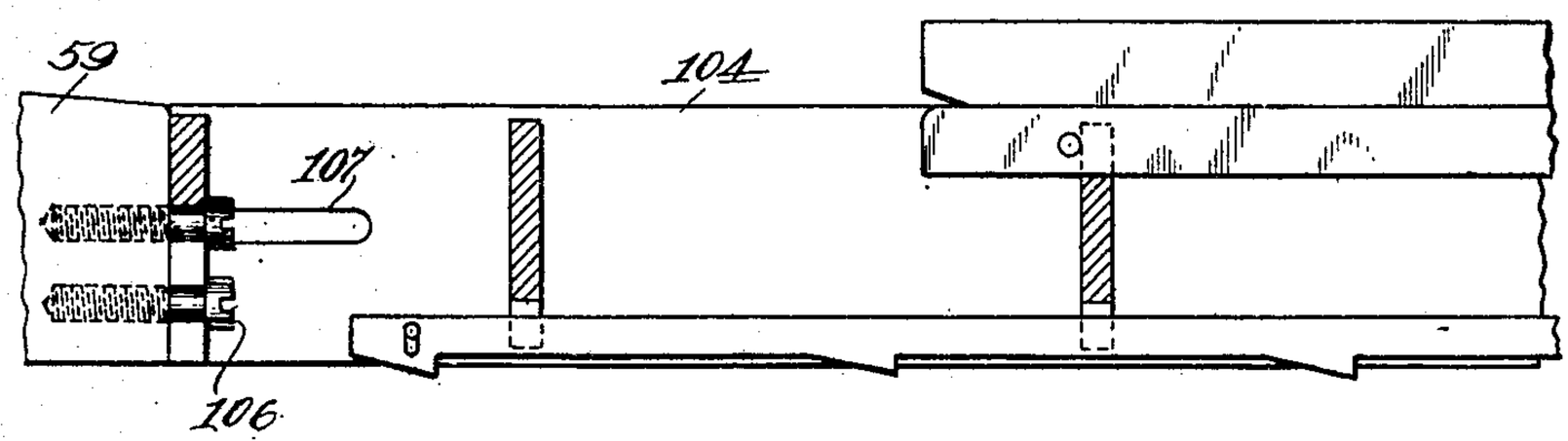

Fig. 10.

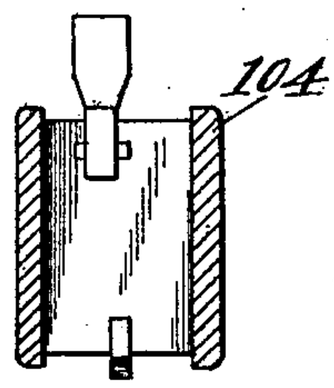

Fig. 11.

Witnesses:

F. L. Maynard.

J. L. Snow

Inventor:

John Eldridge

By Geo. H. Strong. Atty

J. ELDRIDGE.

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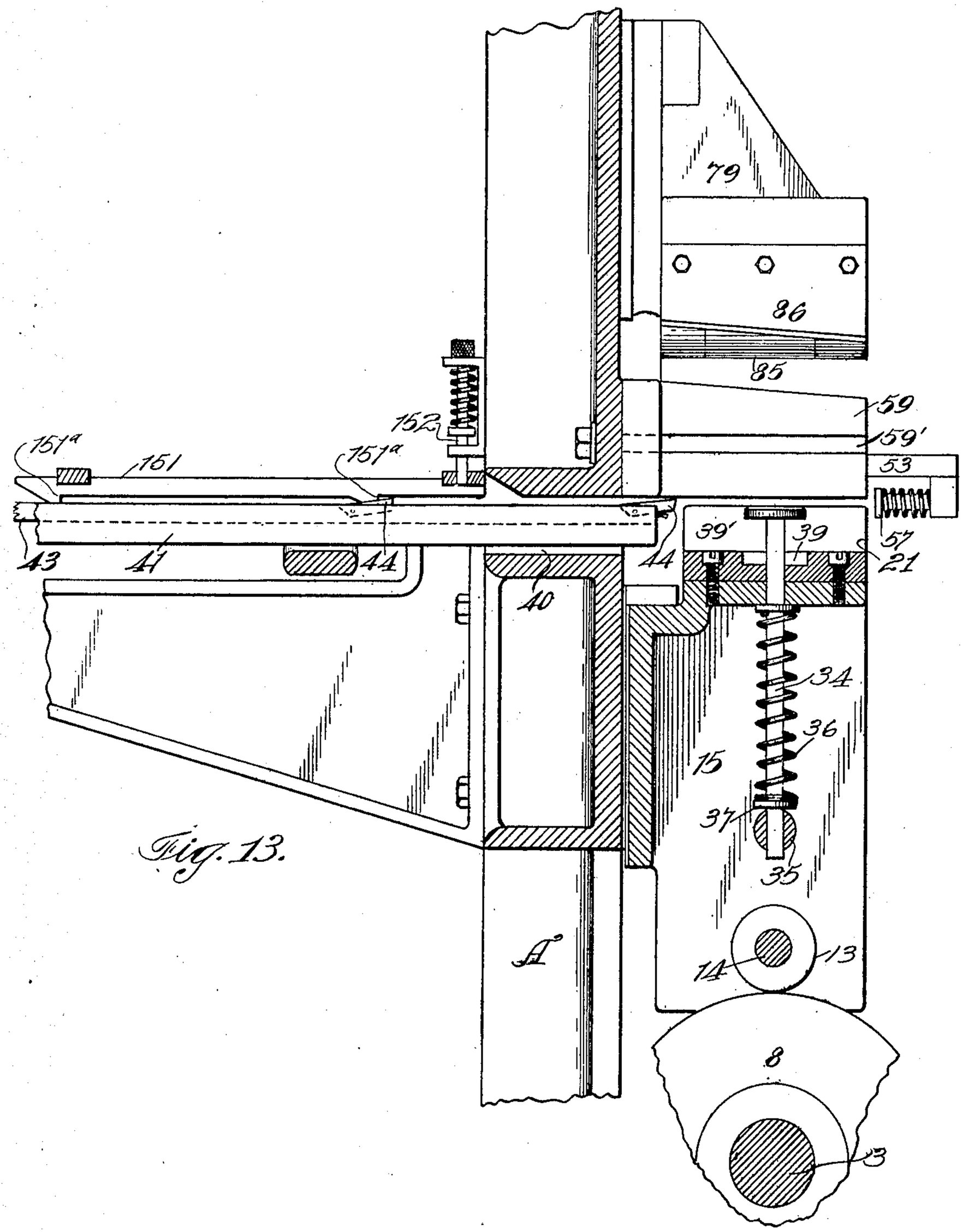

Fig. 13.

WITNESSES:

F. C. Hayward.

J. F. Symes

INVENTOR:

John Eldridge;

BY

Geo. H. Strong

ATTORNEY

J. ELDRIDGE.

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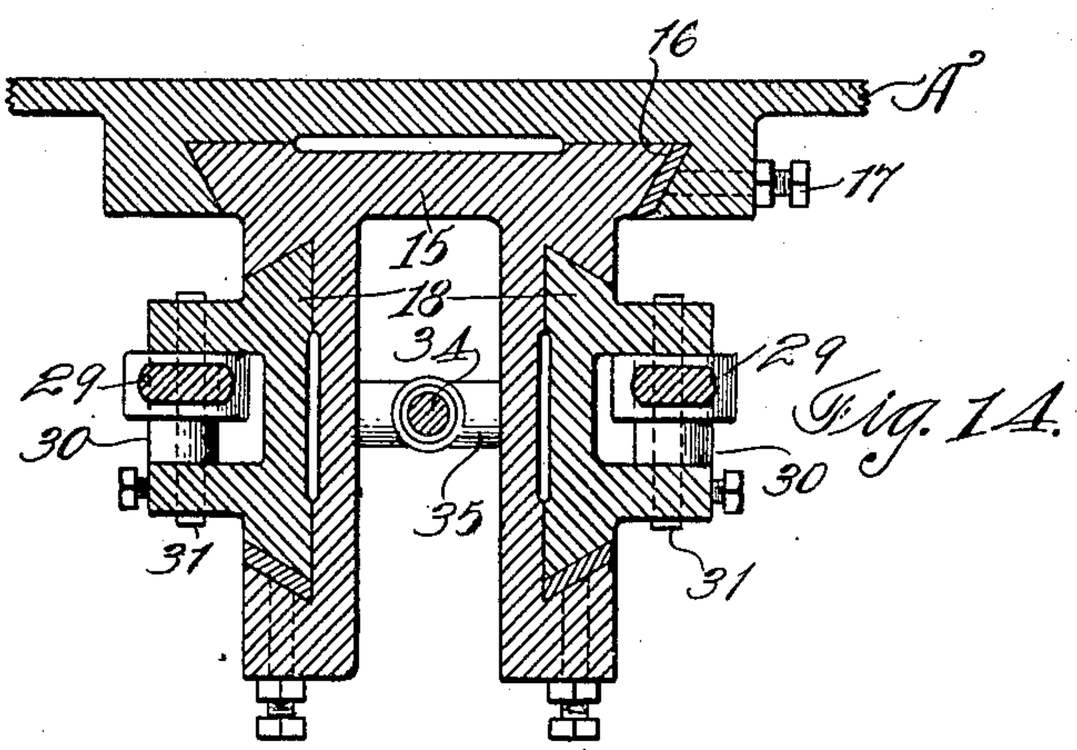

Fig. 1A.

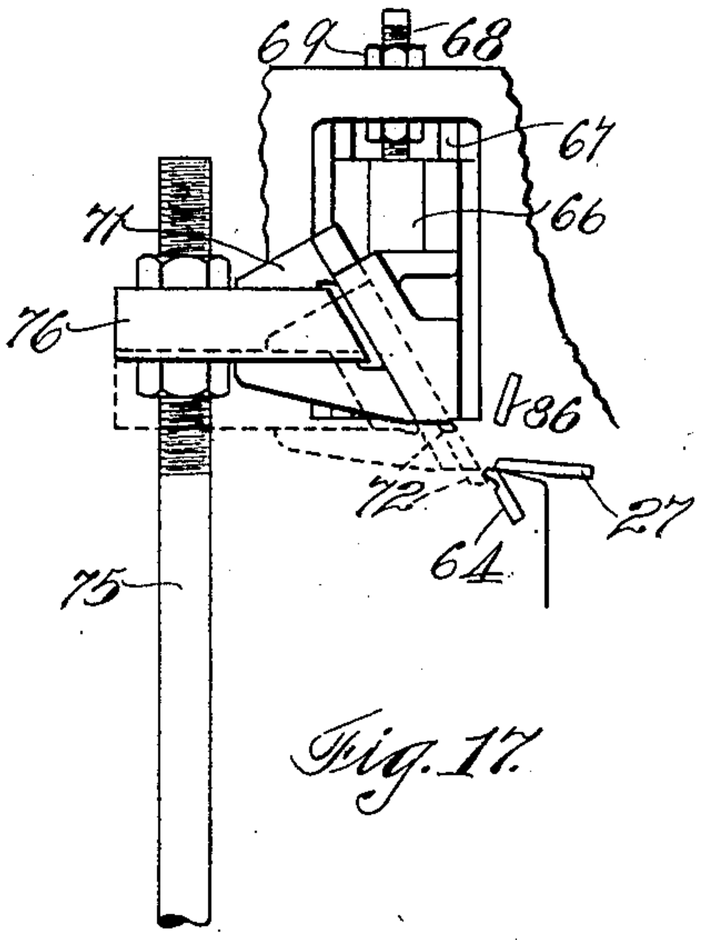

Fig. 17.

WITNESSES:

F. E. Maynard.

J. B. Tower

INVENTOR:

John Eldridge;

BY

Geo. H. Strong

ATTORNEY

J. ELDRIDGE.

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7 SHEETS—SHEET 7.

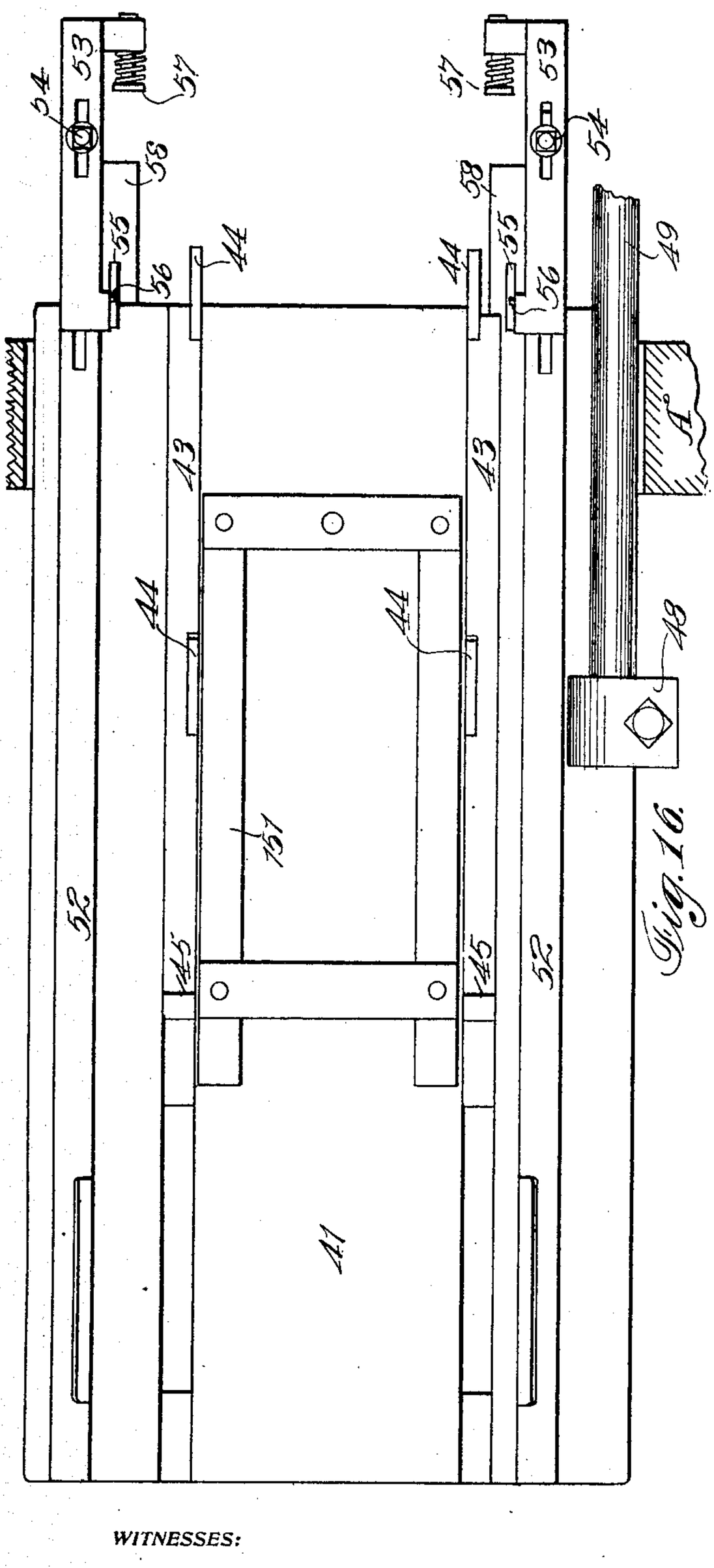

Fig. 16.

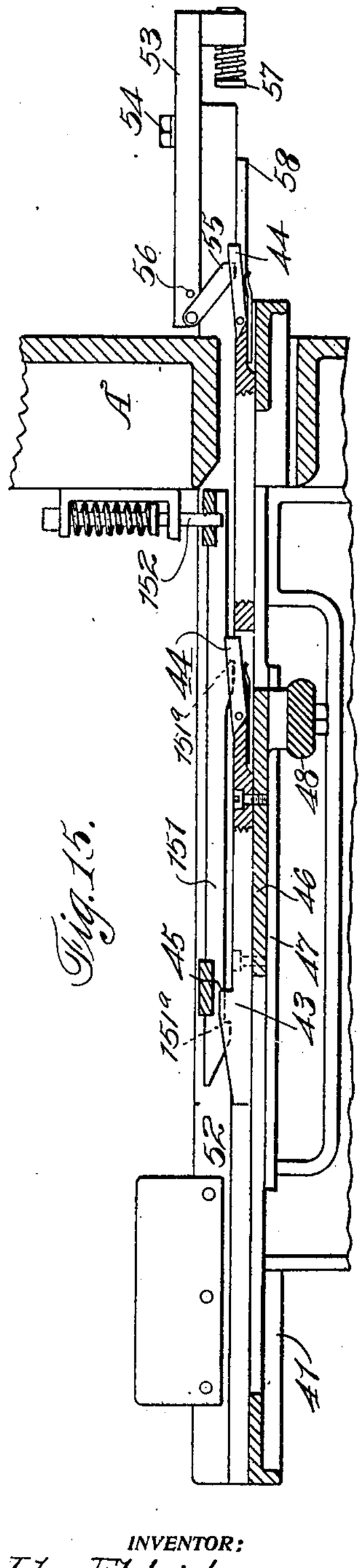

Fig. 15.

WITNESSES:

F. E. Maynard.

J. B. Towse

INVENTOR:

John Eldridge;

BY

Geo. H. Strong

ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN ELDRIDGE, OF ASTORIA, OREGON, ASSIGNOR OF ONE-HALF TO ASTORIA IRON WORKS, OF ASTORIA, OREGON, A CORPORATION.

CAN-BODY FORMING AND SOLDERING MACHINE.

No. 925,883. Specification of Letters Patent. Patented June 22, 1909.

Application filed January 16, 1906. Serial No. 296,298.

To all whom it may concern:

Be it known that I, JOHN ELDRIDGE, a citizen of the United States, residing at Astoria, in the county of Clatsop and State of Oregon, have invented new and useful Improvements in Can-Body Forming and Soldering Machines, of which the following is a specification.

My invention relates to an apparatus for making can bodies from sheets of metal.

It consists in the combinations of mechanism, and in details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a front elevation of the machine. Fig. 2 is a side elevation thereof. Fig. 3 is a perspective view of the forming horn and mold and one wing. Fig. 4 is a perspective view of the ejector. Fig. 5 is a sectional view of the feed mechanism. Fig. 6 is a sectional view of the horn. Fig. 7 is a diagrammatic view of the seaming operation. Fig. 8 is a perspective view of a part of the feed mechanism. Fig. 9 is a detail view in perspective of the soldering horn and forming horn, showing connections. Figs. 10 and 11 are sectional views of the same. Fig. 12 is a side elevation in partial section of the top frame 151 for preventing the backward movement of the blanks on the feed table. Fig. 13 is a vertical section through the main frame feed table and mold carrier. Fig. 14 is a horizontal section on line X—X, Fig. 1, through main frame and slides. Fig. 15 is a vertical longitudinal section through a portion of the machine showing devices for feeding and centering the blanks. Fig. 16 is a plan view of the feeding devices. Fig. 17 is a detail in section of the bracket and slide for operating the upper folder. Fig. 18 is an enlarged detail of the blade 64.

This machine is designed for the making of tapering cans which are rectangular in cross-section, and such as are used for packing corned beef and the like; but it may be used for making cans of any size or shape by substituting different forming horns, molds, wings, and soldering horns, all the other parts remaining the same for all sizes and shapes of cans.

A is a suitable frame in which are journaled the driving shaft 2 and the cam shaft 3. The shaft 2 may be driven by a belt on a friction clutch pulley 4, or by other equivalent means, and it transmits power to the cam shaft 3 through a pinion 5 and a gear 6. Upon the cam shaft 3 are keyed the cams 7—8—9—10 and an eccentric 11. The cam 8 operates through the roller 13 on the slide or carrier 15 which is movable vertically in suitable guides on the face of frame A, being held in place by a gib 16 and screw 17, Figs. 14 and 1. The slide 15 carries the mold 21 on which the blanks for the can bodies are placed by suitable means and by which mold the blanks are lifted and wrapped about three sides of the rectangular forming horn 59, all as will be more fully explained later.

Pivoted to the mold 21, on pivots 22—23, Figs. 1 and 3, are the wings 24—25 carrying at their outer edges the steel blades 26—27. The wings 24—25 operate to complete the folding of the blank about the horn 59 and coöperate with the movable blade or under folder 64 and the upper blade or folder 72 to form the interlocking hooks on the blank as shown in Fig. 7 and as will be more fully described shortly. The wings are operated synchronously with each other and with the movement of the mold from the cams 7—9 on shaft 3 through the following connections; each wing is connected by a link 29, through pins 28—31 and an eccentric adjustment 30, with a slide 18 movable vertically in suitable guides in the mold carrier 15. The slides 18 carry rollers 19 which operate in suitable grooves in the cams 7—9. Thus while the wings are carried by, and have a certain movement in unison with, the mold, they also have a pivotal movement in addition to their vertical movement and independent of the movement of the mold.

Referring to Figs. 1 and 13, 38 is a spring pressed pad or clamp by which the can body blank after being deposited in the mold is clamped and yieldingly held against the underside of the horn 59 during the seaming operation. This clamp pad is mounted on a stem 34 which extends down through the mold and is slidable therein and in a fixed guide 35 on the slide or mold carrier 15. A spring 36 encircles the stem and operates normally to press the pad 38 upward from the recess 39 in the longitudinal channel 39′ in the mold 21. The mold and horn are made symmetrical; that is the longitudinal channel 39′ corresponds in shape and size to the horn 59 since the mold is

designed to be moved up against the horn and partially to embrace three sides of the horn in the act of wrapping the blank around the horn. The pad 38 normally stands with its top surface about flush with the top edges of the mold 21 and a little below the underside of the horn so that the blanks can readily be pushed in on top of the mold in readiness for the folding and seaming operations.

41 is a feed table extending through a throat or opening 40 in frame A. This table is stationary and forms a support for the reciprocating feed bars 43 which carry the spring pressed fingers 44 for propelling the blanks forward; the bars 43 are provided with the hook-shaped portions 45 at the rear end against which the blanks are placed when first put in the machine. The bars 43 are screwed to the plate 46 which slides in guides 47 in the underside of table 41 (Fig. 5). Plate 46 and the feed bars are reciprocated by means of the connecting rod 49 and pitman 50, which latter is connected to gear 6 by pin 51, Fig. 2.

Upon the feed table 41 loosely rests the guide frame 151, Figs. 12—15—8 and 2, which is provided with the underneath notches 151[a] to keep the sheets of tin from sliding backward during the return or rearward movement of the feed bars 43. This frame is loosely held in place by the spring-pressed pin 152, Fig. 15.

52 represents gage bars on the table between which the blanks are fed forward by the feed bars 43. These gage bars 52 carry at their forward ends the pieces or extensions 53 (Figs. 8—15) which are adjustable by means of the set screws 54. The adjustable pieces 53 extend on each side of the mold 21 and beneath the horn 59 and carry at their rear ends the pivoted pawls 55, the upward movement of which is limited by the pins 56. At their forward ends these pieces 53 carry the spring pressed gages 57. The can body blank which is fed forward step by step by the bar 43 and fingers 44 is finally pushed in under the pawls 55 and against the spring pressed gages or abutments 57, supported on the ledges 58 and centered over the mold as will be more fully explained later. (It is understood that the lateral guides 52—53 do not reciprocate).

The forming horn is located just above and with its lower surface in line with the upper edge of the throat 40 through which the feed table 41 projects, and this forming horn is secured by studs 60 passing through holes in the frame A and secured by nuts in the back. Into the upper surface of the horn 59 is let a piece of steel 61 secured by screws and having a groove or spline 62 cut in it for the entire length. At an angle to this piece 61 and for some distance down into the horn extends a groove 63 which is cut through the entire length of the horn 59. Within the groove 63 is placed a steel blade 64 so fitted as to move freely up and down. This blade is moved upward by two pins 65, one near each end and movable in holes in the sides of the horn 59, and acting as wedges, Fig. 6.

The operation of the wedge pins 65 is effected through the medium of the adjustable screws 32 in the wing 25; the upward projection of the blade 64 being effected coordinately with the movements of the mold and wrapping wings 24—25. This blade 64 constitutes an under folder and is adapted to coöperate first with wing 26 of blade 24 to form one hook in the edge of the can body blank Fig. 7, and then to coöperate with blade 27 of wing 25 and the upper folder 72 to form the other hook; said hooks being arranged to interlock and form the can body when properly acted on by the seam closer 86, all as will be more fully explained in the operation of the machine. Above and to the left of the horn 59 is a bracket or support 66 fitted into guides 67 and vertically adjustable by means of a stud 68 and nuts 69, and secured by bolts 70. The bracket 66 carries a slide 71 to which a steel upper folding blade 72 is secured by screws. This slide 71 is operated by a cam groove 12 in the gear 6 by means of the roller 73 mounted on the pin 74, the rod 75 and the adjustable block 76, see Figs. 1 and 17. The lower end of the rod 75 is rectangular in section and moves in a guide bracket 77 while the upper end is round and is fitted to the guide bracket 78. Although the rod 75 and bracket 76 move straight up and down, it is to be observed that the slide 71 which carries the upper folder 72 operates at an incline from the perpendicular; and the path of the folder, is such that the latter will impinge at just the proper angle on the edge of the can body blank to form the hook when the edge of the blank is suitably positioned between the blades 27 and under folder 64 and over the blade 26, as indicated in Fig. 7. The respective upper and lower folders 72—64 move toward and from each other in nearly coincident inclined paths and laterally of the horn. Above and to the right of the horn 59 is a bracket or support 79 fitted into guides 80, and adjustable vertically by a stud 81 and nuts 82 secured by bolts 83. In the brackets 78 and pivoted upon a pin 84 is the bumper lever 85 carrying on its inner end the bumper steel head or seam closer 86, and at its outer end it is connected through a pin 87, link 88, a pin 89 and adjustable block 90 to the vertical rod 91 which is actuated by the cam 10 through the roller 92 mounted upon the pin 93. The lower end of the rod 91 is rectangular in section and runs in the guide bracket 94 while its upper end is round and is fitted to a guide bracket 95.

The lever 85 being pivoted at one end as shown allows the seam closer 86 to move in the arc of a circle rather than in a straight up and down or rectilinear path as is usual with most bumping or seam closing devices.

The ejection of a finished can body from the horn is effected by the following means: Above the feed table 41 and connected to move with the reciprocating bar 49 by the arms 153, Figs. 4—6, are the ejector bars 154 which work in slots 59′ in the sides of the horn 59. These ejector bars 154 are pivoted on screws or pins 155 and are suitably acted on by the spring 156. The movement of the arms 154 toward each other is limited by the stop pins 157. When the can body has been completed, it is pushed off the forming horn 59 and upon the soldering horn 104 which is in line with the horn 59, and may have one end removably attached thereto. This end of the soldering horn is shown as having a vertical slot 105 which is fitted over pins 106 having suitable heads to lock in the slot and hold this end of the soldering horn in position to receive the can bodies as they are ejected from the forming horn. The outer end of the soldering horn may be suitably supported by devices not here shown. This horn is hollow and has an open channel at the top, and is provided with exterior and interior soldering irons, not shown against which the seam moves so that it will be soldered on both sides, suitable means being employed to heat the irons and to feed solder wire into contact with the seam. The sides of the soldering horn are channeled as shown at 107, and these channels are in line with the channels in the sides of the horn 59 so that the ejector bars 154 may reciprocate far enough to deliver the can bodies from the forming horn to the soldering horn over which they are intermittently advanced in unison with the arrival of each can body from the forming horn.

The operation of the machine will then be as follows: The tin blanks having the proper form for the can to be made, are placed upon the feed table 41, and are carried forward step by step by the feed bars 43 and their spring-pressed fingers or pawls 44. The blanks are prevented from slipping backward by the frame 151 which rests loosely on the table 41 and is held in position by the pin 152. The blank is thus carried forward by the feed device until it rests upon the top of the mold 21 and on the ledges 58, between which the mold is movable. While being brought into this position the blank passes under the pawls 55 which are raised by contact with the blank and which fall behind it after it passes. As it passes forward, the leading corners of the blank come in contact with the spring-pressed gages 57 which are thus forced forward a short distance, preferably about $\frac{1}{8}$ of an inch, and as the feed device recedes these spring gages set the blank back against the pawls 55, thus bringing it square with the forming mold 21 and the horn 59. As soon as the blank is brought to this position the forming mold 21 begins to rise under the action of the cam 8, and at the same time the wings 24—25 begin to close under the action of the cams 7—9, thus causing the blank to be wrapped around the horn 59. Meanwhile, and as soon as the mold-carrier starts to lift, the pad 38 acts yieldingly to clamp the blank against the horn. The wing 24 closes a little in advance of the wing 25, and the length of the blank is so regulated that its edge will project for a short distance, about $\frac{1}{8}$ of an inch, over the edge of the blade 64; being held to this position by the edge 26 on wing 24. At this point, the wing 25 will have closed just far enough to bring the points of the screws 32 into contact with the ends of the wedge pins 65. The wing 25 continues its movement, thus forcing the wedge pins 65 inward and elevating the blade 64. The edge of the blank is thus folded up over the edge of the blade 26 of wing 24, forming a hook and clamping the second edge of the blank between the upper edge of the blade 64 and the lower side of the blade 27 of wing 25. The next action is the descent of the blade 72 which turns the second edge of the blank down over the edge of the blade 64, and at the same time over the hook formed in the first edge of the blank as plainly shown in Fig. 7. It will be noted that the blade 26 has a slight projection beneath its edge for the purpose of setting the tin down into the groove or spline in the top of the horn, and that the blade 64 has a slight recess near its upper edge just sufficient to allow the first folded edge of the tin to lie within it when the second edge is folded down. The wings now begin to open, releasing the wedge pins 65 and leaving the blade 64 free to be pushed back into the horn under the action of the seam closer 86 which now descends, pushing the two folded edges of the blank together, and pressing them down into the spline 62, thus finishing the lock seam. During this operation the blade 64 acts as a guide for bringing the folds accurately together within the spline or groove 62. The can body is next pushed from the forming horn 59 upon the soldering horn 104 by the ejector bars 154, and is then carried along step by step to the discharge end of the soldering horn, during which movements the soldering of the seam is completed by means not necessary here to be shown. Before the ejector bars are fully withdrawn, another blank will be in process of folding about the forming horn, and the yielding of the spring 156 allows the bars to be pressed into the channels of the horn, so that the blank can be

folded smoothly about the horn. As soon as the ejectors are fully retracted the spring 156 acts to separate the outer ends so that they again stand in line with the edge of the can.

It will be observed that all the operation of forming up the can body, turning the hooks on the edges of the blank and bumping or closing the seam, are performed while the blank is in one position on the horn. This is particularly important in making conical or pyramidal cans. Another novel feature it will be observed, is utilizing the edge of one forming wing, (*i. e.* wing 24,) as a form over which to bend a hook on one edge of the blank and the accomplishment of this result by mechanism (*i. e.* the blade 64) actuated by the opposite wing.

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

1. A machine for making can bodies, consisting of a horn, mechanism by which blanks are advanced and placed against the horn, mechanism by which the sheets are folded about the horn, lock seam forming devices coacting with said folding mechanism, said seam forming device including a slidable blade in the horn and means by which the can bodies are moved from the forming horn, said means consisting of hinged slidable and guided push bars movable in lines parallel with the axis of the horn.

2. In an apparatus for making can bodies, a horn, a mold located beneath the horn, mechanism by which sheets of tin are advanced to rest upon the mold, means for retaining the sheets in position with relation to the horn, wings by which the sheets are folded around the horn, mechanism including a blade carried by the horn coacting with the wings, by which the edges of the sheets are bent and interlocked, a bumper by which the interlocked edges are closed, and mechanism by which the can is advanced and discharged from the forming horn.

3. In a can body forming machine, a fixed horn, a feed table upon which sheets of tin are placed, feed bars engaging the edges of the sheets of tin and advancing the said sheets step by step, a mold located beneath the horn upon which the blank is delivered, and ledges and spring pressed gage bars fixed and supported with respect to and independent of the mold by which the position of the blank with relation to the horn is fixed prior to its being folded about the horn.

4. In a can body forming machine, a fixed horizontal horn, a mold located beneath the horn, a table adapted to receive the blanks, spring-pressed pawls, mechanism by which they are reciprocated to advance the blanks step by step, and deposited on the mold, a frame resting loosely upon the table adapted to prevent the backward movement of the blanks when the feed bars are retracted, means to move the mold toward and from the horn, wings on the mold and a folder carried by the horn and operative by a wing to form a hook on the blank.

5. In a can body forming machine, a horn, a mold movable to and from the horn, a table adapted to receive the prepared blanks, reciprocating feed bars having spring-pressed fingers adapted to advance the blanks by intermittent movements, and between which the blank moves, adjustable pieces on the front end of the gage bars, ledges carried by said pieces upon which the blanks rest, spring-pressed pawls and spring supported stops carried by said adjustable pieces whereby the blanks are accurately placed with relation to the forming mold and horn.

6. In an apparatus for making can bodies, a feed-table adapted to receive the blanks, reciprocating feed bars by which the blanks are intermittently advanced, gages by which the position of the blanks is regulated, a mold upon which the blanks are placed, a horn superposed above the mold, pivoted wings having folding blades at the edges adapted to engage the projecting edges of the blanks which project beyond the horn, mechanism by which the wings and blades are moved toward each other to fold the sheet over the horn and mechanism in part carried by the horn, coacting with and operated by the wings by which the meeting edges of the sheet are bent and interlocked with each other.

7. In an apparatus for making can bodies, a table, feed bars whereby blanks are advanced, a mold upon which said blanks are placed, means for adjusting the blanks with relation to the mold, means for holding the sheets against the horn, pivoted wings, mechanism by which they are caused to swing toward and embrace the horn, said wings having blades to engage the projecting edges of the blanks and fold the blanks about the horn, mechanism coacting with and operative by said wings by which the edges of the blanks are bent to interlock with each other, and a bumper swinging in the arc of a circle to close the seam.

8. In a can making machine, a table adapted to receive blanks, mechanism by which the blanks are intermittently advanced, a mold upon which the blanks are delivered, means by which the blanks are adjusted upon the mold, a horn located above the mold, cam-actuated mechanism by which the mold is raised toward the horn, wings having their inner ends pivoted contiguous to the mold and the lower side of the horn, blades carried by the outer

edges of the wings, cam mechanism by which the wings are caused to close inwardly and fold the blank about the horn, an angularly placed slidable blade located within the horn, wedge pins contacting with said blade and screws carried by the folding arms and contacting with the wedge pins whereby a wing is advanced and one edge of the blank is bent to form a member of the interlocking seam.

9. In a can body forming machine, a feed-table to receive the blanks, a mold located with relation to the feed-table, means for advancing and placing the blanks upon the mold, a horn located above the mold, means for raising the mold and the blank against the bottom of the horn, wings pivoted contiguous to the mold and the lower part of the horn, and having folding blades at their outer edges, cams by which the mold is raised, other cams by which the folding wings are caused to close and fold the blank over the horn, a blade slidable in inclined channels within the horn, wedge pins also movable in the horn and contacting with the inner edges of the blade, screws carried by the folding arms to contact with the pins when the blank has been closed into position whereby one edge of the blank is folded upward against the edge of the folding blade to form a hook.

10. In a can forming machine, a table adapted to receive blanks, a mold located with relation to the table, reciprocating feed bars by which the blanks are advanced and gages by which they are accurately placed upon the mold, a horn located above the mold, pivoted wings having blades on their outer edges, mechanism by which the mold is advanced to press the blank against the horn, mechanism by which the wings are closed to fold the blank about the horn, one in advance of the other, whereby one edge of the blank is first laid upon the top of the horn, a diagonally slidable blade carried in a channel in the upper part of the horn with its edge contacting with the previously placed edge of the blank, wedge pins, and screws carried by the other folding arm, said screws forcing the pins inwardly and advancing the blade to fold the edge of the sheet into a hook form over its blade.

11. In a can body making machine, a vertically reciprocating mold, a horn fixed horizontally above the mold, means for placing blanks upon the mold, means for raising the mold to press the blanks against the lower part of the horn, wings fulcrumed contiguous to the mold and the opposite lower edges of the horn, blades carried by the outer ends of the wings, cams by which the wings are caused to close inwardly simultaneously with the upward movement of the mold, one of said wings being moved a little in advance of the other to fold one edge of the blank down upon the horn, a blade slidable in a diagonal channel in the horn, mechanism actuated by the approach of the other folding wing whereby said blade is advanced to turn the already placed edge of the blank over the edge of its folding wing and form a hook, the second wing subsequently folding the opposite edge of the blank over the previously formed hook, an upper folding blade reciprocal with relation to the horn whereby said projecting second edge is folded to interlock with the first folded hook.

12. In a can body making machine, a mold, means for placing and adjusting blanks upon the mold, a fixed horn located above the mold, said horn having a recess in its upper surface, wings pivoted contiguous to the base of the horn, means by which the mold is raised to press the central portion of the blank against the horn, means by which the wings are moved to close the edges of the blank above the recess in the horn, lower and upper folding blades coacting with the edges of the wings by which the edges of the blanks are bent and caused to interlock, and a bumper by which the seam is compressed, said lower blade slidingly mounted within the horn.

13. In a can body making machine, a mold and a superposed recessed horn, means for feeding and adjusting blanks centrally on the mold beneath the horn, hinged wings with folding blades at the outer ends, one of said blades having a projection on its edge, a diagonally slidable plate in the horn beneath the other folding blade, said plate having a recess corresponding with the projection on the first-named folding blade, a reciprocating blade acting in conjunction with the first-named blade and plate to fold and interlock the edges of the blank, and a bumper by which the seam is compressed into the recess of the horn.

14. In combination, a horn having an under-folder, pins for operating said under-folder, wings for folding a blank about the horn, and means carried by one wing to actuate said pins.

15. In a can body forming machine, a horn and mechanism by which blanks are folded about it and a lock seam formed in the meeting edges of the blank, channels in the sides of the horn, ejector bars reciprocating on lines parallel with the horn to eject the can and yielding connections whereby the bars may be pressed into the channels when a blank is folded over them and the horn, a folding blade in the horn, wings to wrap the blank about the horn, and means actuated by one wing to operate said folding blade.

16. In a can body forming machine, a horn and mechanism by which blanks are folded about it, and a lock seam formed in

the meeting edges of the blank, ejector bars slidable along the sides of the horn to eject the cans, a reciprocal bar to which the ejector bars are pivoted, channels in the sides of the horn into which the ejector bars are compressible when a blank is folded over them, a spring by which said bars are separated when withdrawn from the channels, and stops limiting their outward movement.

17. In a can body making machine, a table adapted to receive blanks, mechanism by which the blanks are intermittently advanced, a mold upon which the blanks are delivered, means by which the blanks are adjusted upon the mold, a horn located above the mold, cam-actuated mechanism by which the mold is raised toward the horn, wings having their inner ends pivoted contiguous to the mold and the lower side of the horn, blades carried by the outer edges of the wings, cam mechanism by which the wings are caused to close inwardly and fold the blank about the horn, an angularly placed slidable blade located within the horn, and means to actuate said blade to cause it to coöperate with one wing and form a hook on the blank.

18. In a can body forming machine, a horn, wings pivoted upon opposite sides of the horn, mechanism by which the wings are moved to fold a blank about the horn, one of said wings serving as a form over which one edge of the blank is bent, a reciprocating blade by which the other edge is bent and interlocked with the first-named edge, and means for closing the interlocked edges.

19. In a can body forming machine, a blank supporting table, reciprocating feed bars with spring-pressed pawls to engage the rear edges of the blanks and advance them step by step, a frame beneath which the blanks are advanced, said frame having latches to prevent return movements of the blanks, a mold upon which the blanks are received, and yielding stops against which the forward edges of the blanks contact and stop pawls at the rear.

20. In a can body forming machine, a horn, means for folding blanks about the horn and forming uniting seams, a soldering horn having one end locked to the end of the forming horn, channels in line upon the sides of the horns, ejector bars and means by which they are reciprocated to move the cans from the forming to the soldering horn, said bars lying partly in the channels, and compressible therein to have the horn surfaces flush.

21. In a can body forming machine, the combination of a polygonal tapered horn, and means for forming tapered can bodies on said horn in one position thereon, said means including a mold movable toward and from the horn, wings pivoted on said mold to wrap the can body blank around the horn, and folding devices coöperating with the edges of the wings to form interlocking hooks on the opposite edges of the blank.

22. A machine for making can bodies comprising a horn, a member to support a can body blank with relation to the horn, means for moving said member toward and from the horn, wings on said member to wrap the blank around the horn, and mechanism actuated by one wing to bend a hook on one edge of the blank over the edge of the opposite wing.

23. In a can body forming machine, the combination of a horn, means including two folding wings to wrap a can-body blank around the horn, and mechanism actuated by one wing to bend one edge of the blank over the edge of the opposite wing to form a hook.

24. In a can body forming machine, the combination of a horn, means including two folding wings to wrap a can-body blank around the horn, mechanism actuated by one wing to bend one edge of the blank over the edge of the opposite wing to form a hook, and other mechanism coöperating with the said actuating wing to form a hook on the other edge of the blank.

25. In a can-body forming mechanism, the combination of a horn, means including a pair of wings to wrap a blank around the horn, inside and outside folders coöperating with said wings to bend hooks on opposite edges of the blank, and means for operating one of said folders by the wings.

26. In a can-body-forming machine, a horn, a lower folder arranged therein, folding-wings, means for operating said wings, means for operating said lower folder, one of said wings coöperating with the lower folder to make the first fold in the blank, substantially as described.

27. In a can-body-forming machine, a horn, a lower folder within the horn, folding-wings, means for operating the folding-wings, means for bending the blank about the horn, and means for operating the lower folder, said lower folder coöperating with one of the wings to make the first fold, and means coöperating with the said lower folder when projected to make the second fold, substantially as described.

28. In a can-body-forming machine, a horn, a lower folder within the horn, folding wings, means for operating the folding-wings for bending the blank about the horn, and means for operating the lower folder, said lower folder coöperating with one of the wings to make the first fold, and means coöperating with the said lower folder to complete the same, said coöperating means comprising an upper folder and a seam-closer, the former of which makes the second fold, while the lower folder remains

projected and the latter of which upon the receding of said under folder advances to complete the seam, substantially as described.

29. In a can-body-forming machine, a folder-blade in the horn formed with an edge adapted to project through a slot in the horn, and a wiping-wing arranged to coact with the folder-blade, to form the first fold, said folder bending the end of the blank over the edge of the wing after the wing arrives in its holding position against the horn.

30. In a can-body-forming machine, a folder-blade formed with an edge adapted to project through a slot in the horn and to present a surface which is substantially a continuation of that of the horn, a wiping-wing first acting to wipe on the first or underlying end of the blank and coacting with the folder to form a fold on said end, a second wiping-wing next acting to wipe on the other end of the blank, and an upper folder arranged to form the fold in said other end of the blank on that first made.

31. In a can-body-forming machine, a folder-blade formed with an edge adapted to project through a slot in the horn and to present a surface which is substantially a continuation of that of the horn, a wiping-wing first acting to wipe on the first or underlying end of the blank and coacting with the folder to form a fold on said end, a second wiping-wing next acting to wipe on the other end of the blank, an upper folder arranged to form the fold in said other end of the blank on that first made, and a seam-closer acting finally to close the seam.

32. In combination with the horn, the folding-wings, folding devices, one operating within the horn and one operating externally thereto, a seam-closer operating externally to the horn, and carrying means therefor moving the said seam-closer in a curved path to close the seam with a rubbing movement, substantially as described.

33. In combination, the horn, means for forming the can-body about the horn, a lower and an upper folder operating on the blank to interlock the edges after being formed about the horn, and a seam-closer external to the horn having a lateral wiping action in relation to the seam, after the folding has been completed, the seam being closed by said wiping action, substantially as described.

34. In combination, the horn, the under folder presenting an overhanging edge, and an upper folder operating at an inclination to turn the edge of the blank over and slightly beneath the said overhanging edge, and a seam-closer acting independently of the folder and having a lateral wiping action on the seam, substantially as described.

35. In combination, the horn, the under folder presenting an overhanging edge, and an upper folder operating to turn the edge of the blank over the said overhanging edge, and a seam-closer acting independently of the folder, said seam-closer being external to the horn and having a wiping action transversely of the seam, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN ELDRIDGE.

Witnesses:
F. L. Bishop,
G. C. Fulton.