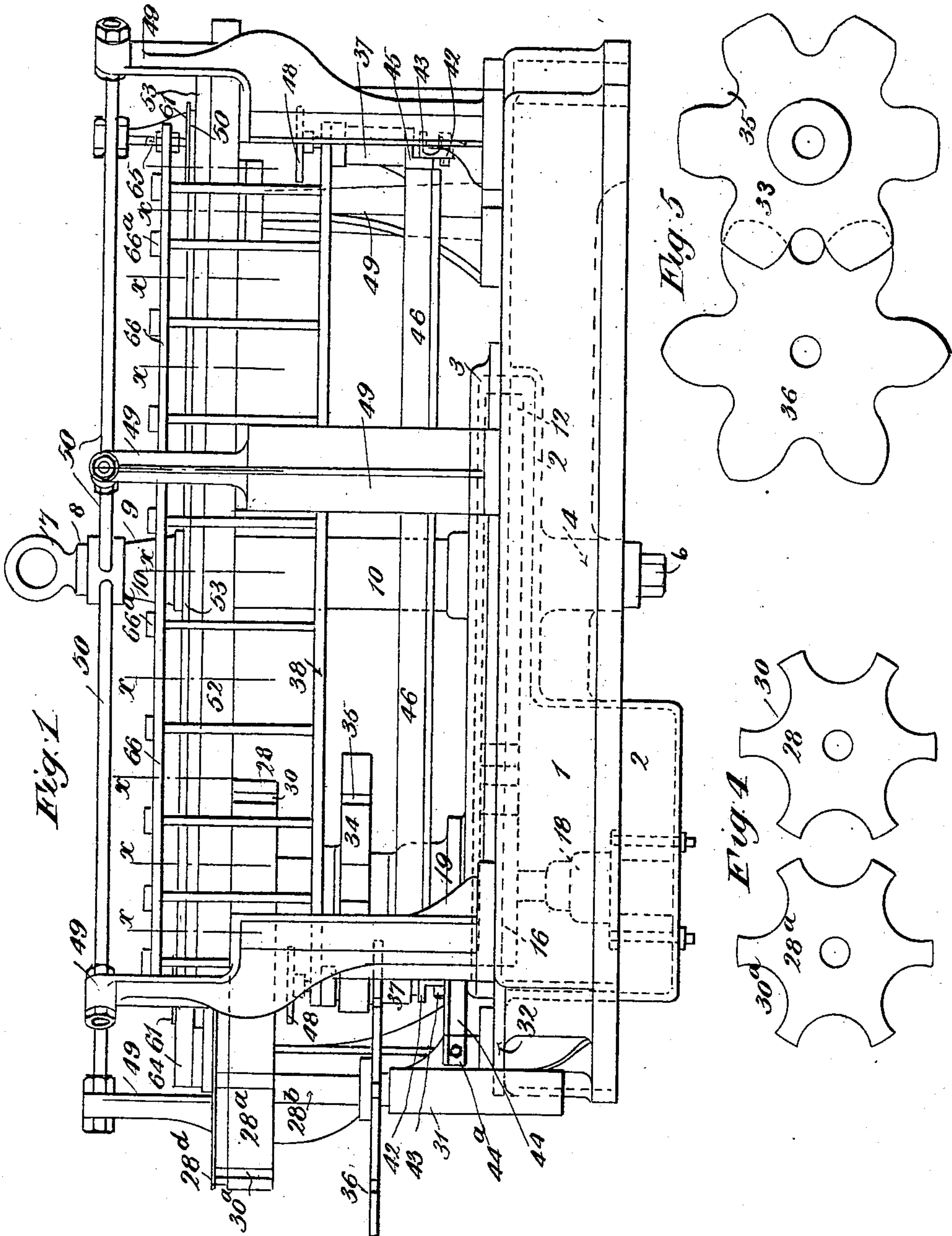


C. T. LACK.
MACHINE FOR CLOSING CANS AND LIKE RECEPTACLES.
APPLICATION FILED DEC. 17, 1909.

969,166.

Patented Sept. 6, 1910.

5 SHEETS—SHEET 1.



Witnesses:
L. C. Gadeau.
H. D. Penney

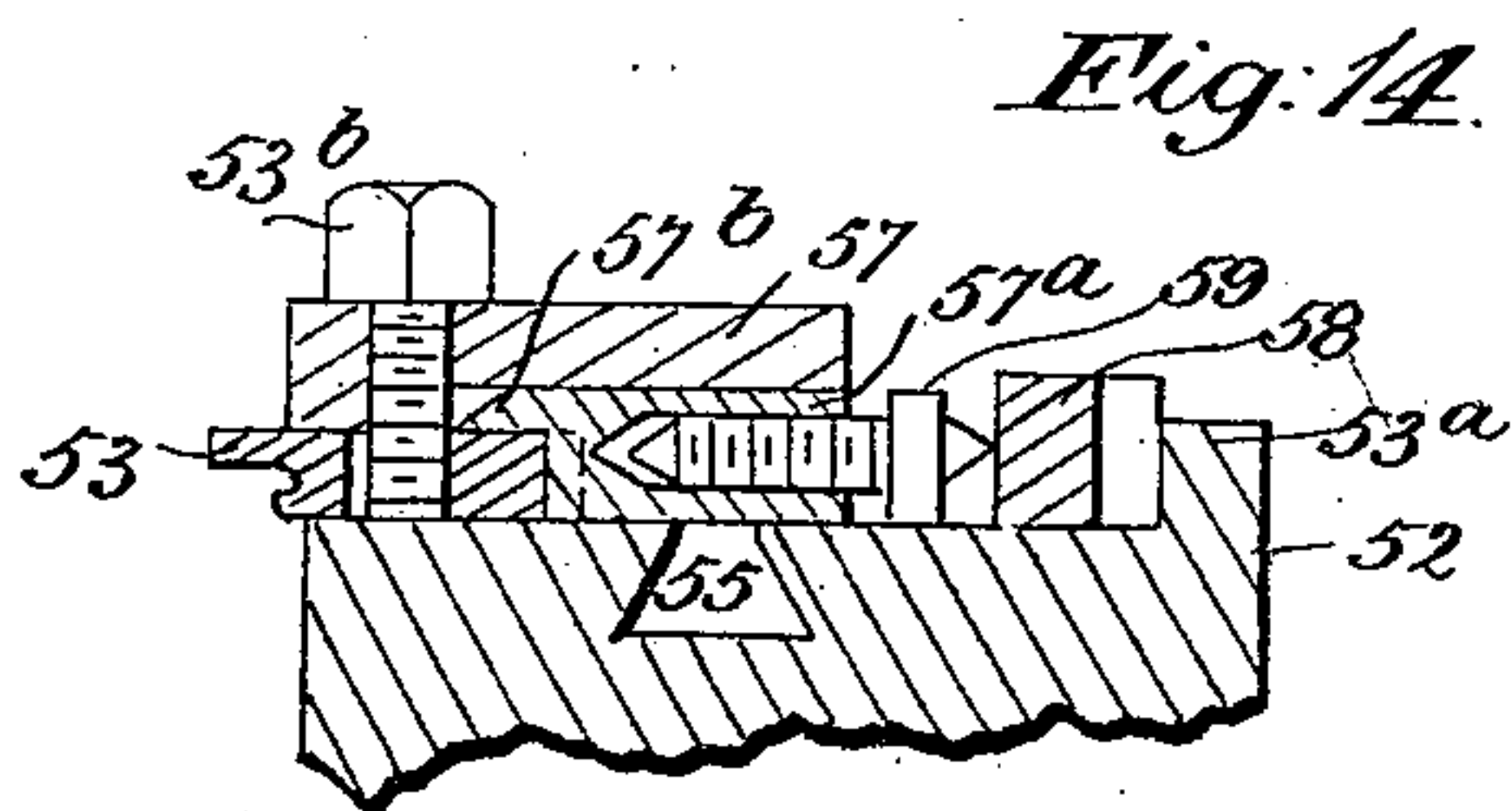
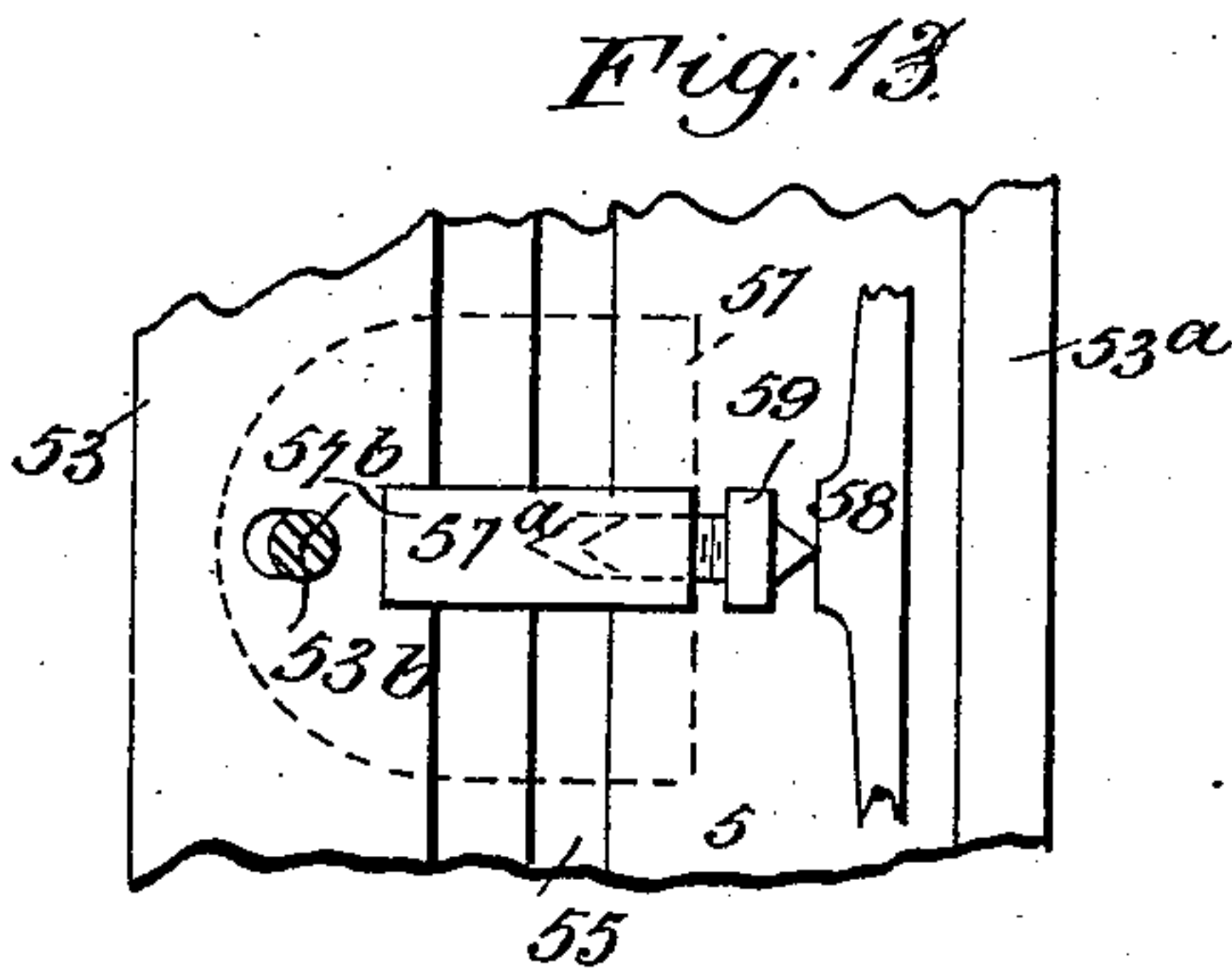
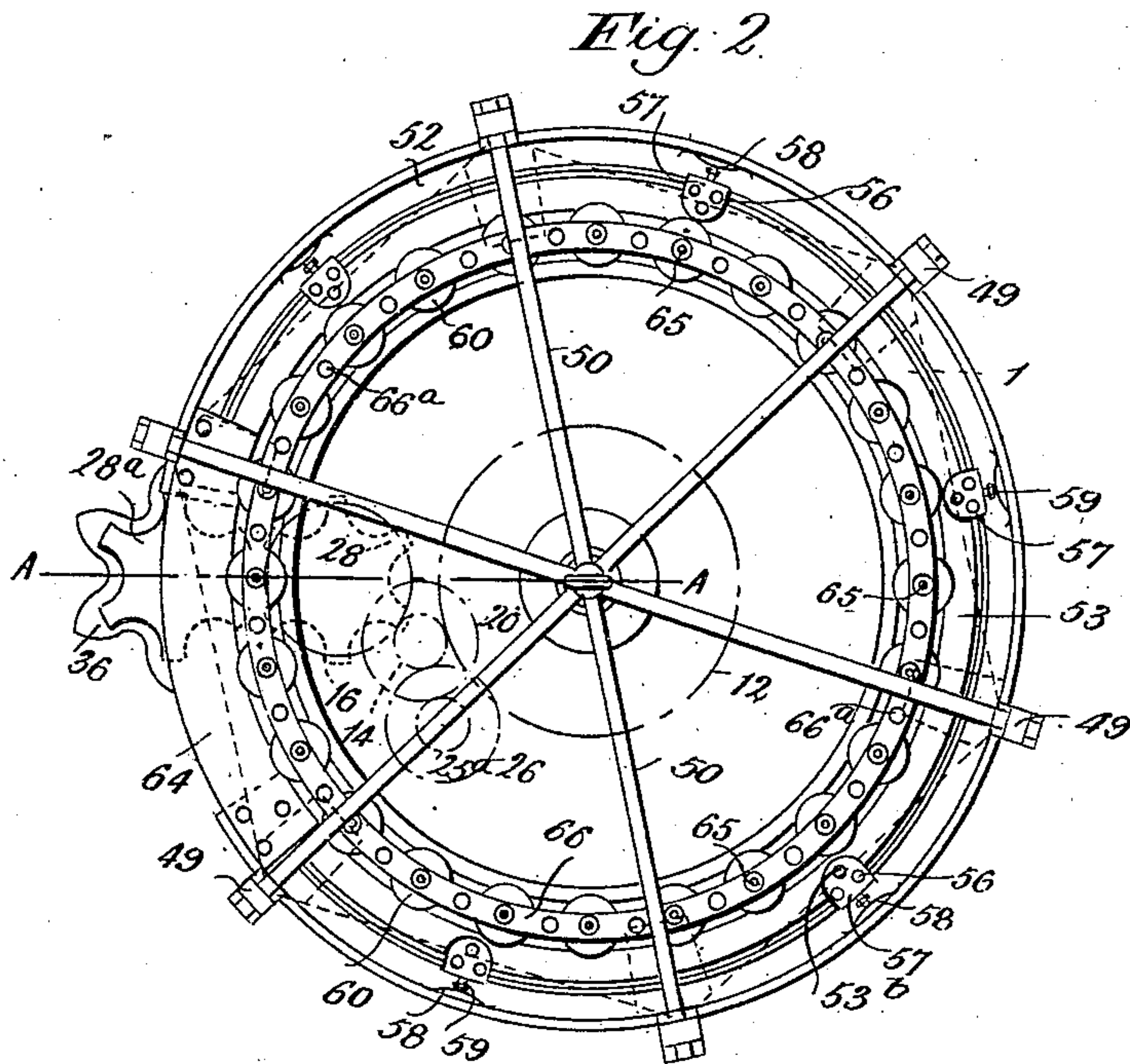
Inventor:
Charles Tibbit Lack,
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5 SHEETS—SHEET 2.



Witnesses:
L. C. Badeau.
H. J. Penney

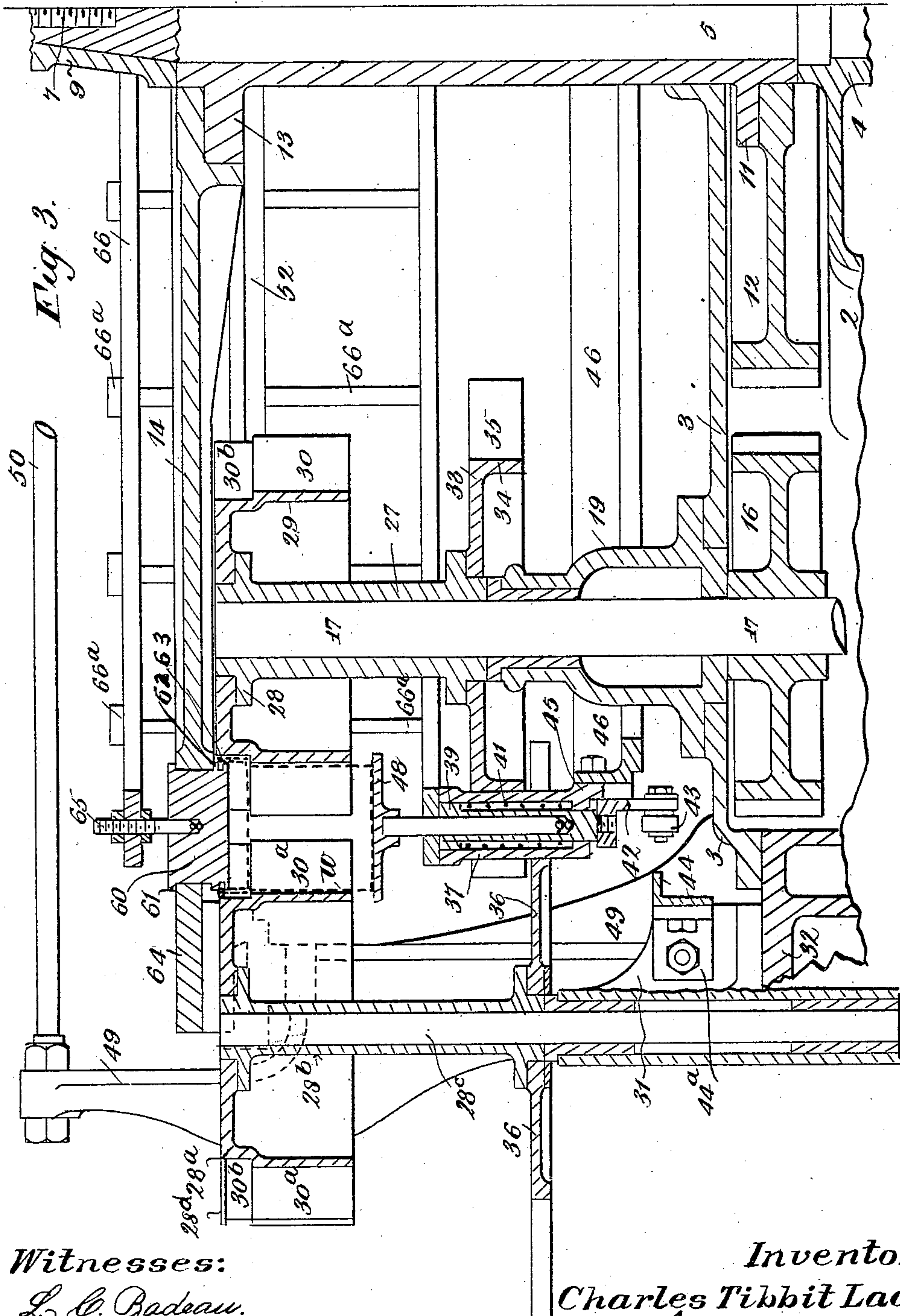
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5 SHEETS—SHEET 3.



Witnesses:
L. C. Badeau.
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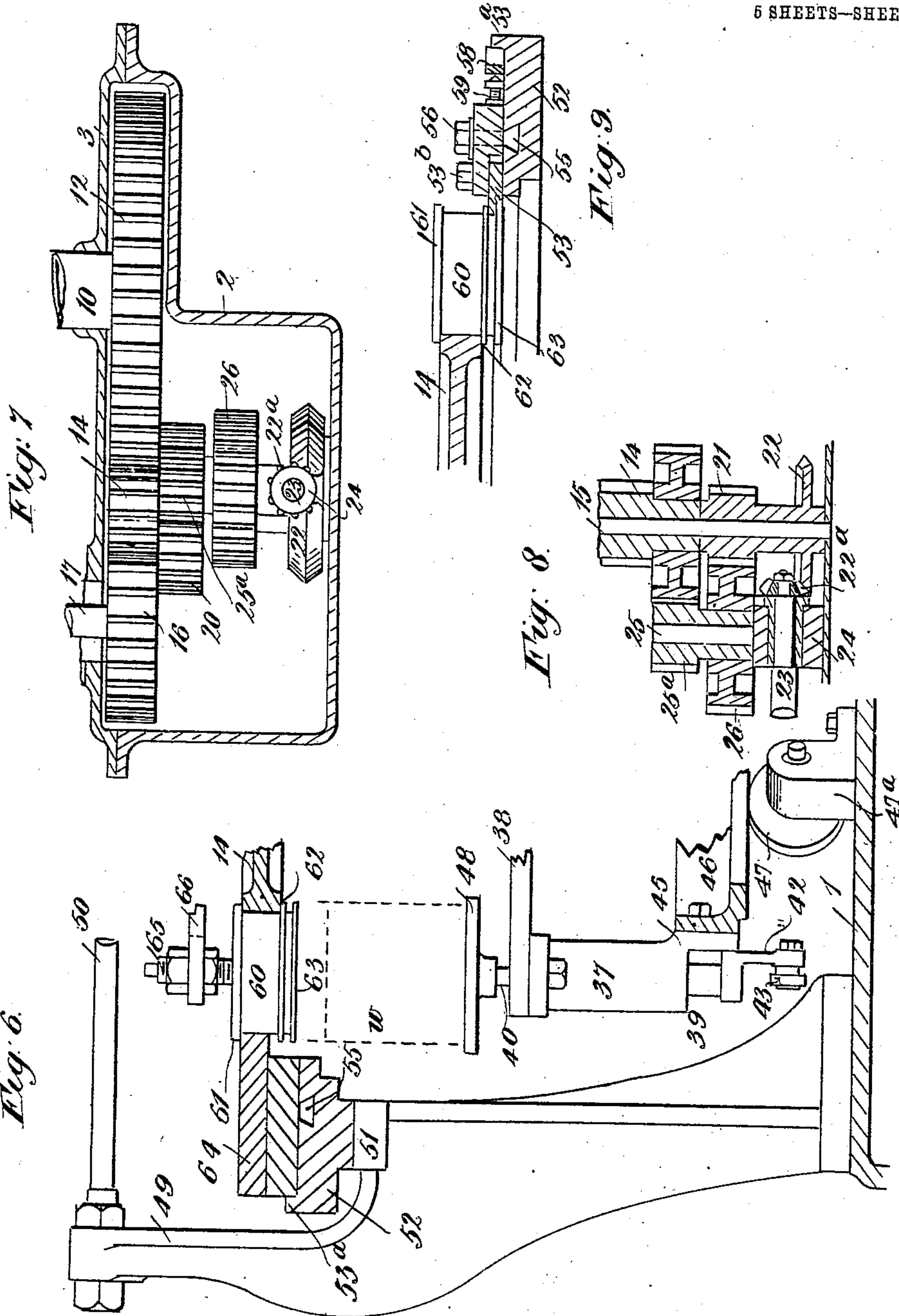
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6 SHEETS—SHEET 4.



Witnesses:
L. C. Badeau.
H. D. Penney

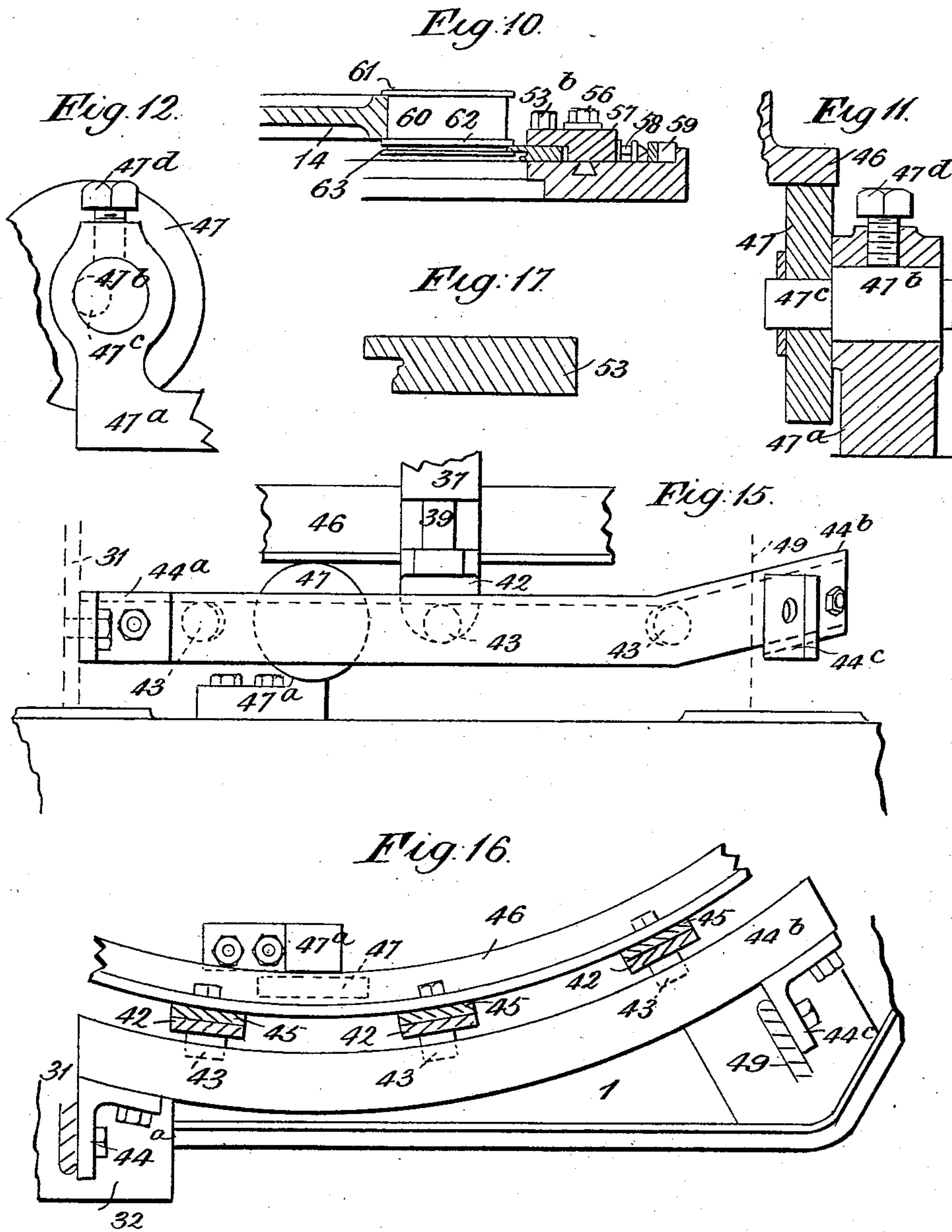
Inventor:
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5 SHEETS—SHEET 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

CHARLES TIBBIT LACK, OF IMPINGTON, ENGLAND.

MACHINE FOR CLOSING CANS AND LIKE RECEPTACLES.

969,166.

Specification of Letters Patent.

Patented Sept. 6, 1910.

Application filed December 17, 1909. Serial No. 533,555.

To all whom it may concern:

Be it known that I, CHARLES TIBBIT LACK, a subject of the King of Great Britain, residing in Impington, England, have invented certain new and useful Improvements in Machines for Closing Cans and Like Receptacles, of which the following is a specification.

This invention relates to an improved machine for closing cans and like receptacles, and it has for its object to provide a machine for effecting the attachment of the closure by folding or bending together the end of the can and the closure, thus forming what is known as a "double seam", in a more expeditious manner than with machines as at present constructed. A machine such as that forming the subject of the present application moreover presents the advantage that where the contents are in a more or less liquid condition the spilling of same during the closing operations is avoided.

The machine consists essentially of a fixed and rotating body by which the folding or bending is effected and between which bodies the upper ends of the cans are subjected to a rolling action at the same time being acted upon under considerable pressure. During the rolling and compression the end of the can is supported internally by a suitably shaped roller which rests upon the upper surface of the closure.

In order that the invention may be the better understood, drawings are appended in which:—

Figure 1. is an elevation of a machine constructed in accordance with the present invention. Fig. 2. is a plan of the machine on a reduced scale. Fig. 3. is a section to an enlarged scale on line A A Fig. 2. Fig. 4. is a plan of the means for introducing the cans between the seaming or folding bodies. Fig. 5. is a plan showing the means whereby the rotation of the body carrying the supports for the cans is effected. Fig. 6. is a sectional view showing the means of support for the rollers assisting in the support of the can at the point where the folding body is removed. Fig. 7. is an elevation showing the gearing whereby the machine is operated. Fig. 8. is a sectional view at a right angle to Fig. 7. Fig. 9. is a sectional view showing the shape of the folding body. Fig. 10. is a sectional view showing the shape of the folding body at a dif-

ferent point to that shown in Fig. 9. Fig. 11. is a sectional view showing the roller supporting the annular body attached to the plunger casings and the means for effecting the vertical adjustment of said roller. Fig. 12. is a side view of the bracket shown in Fig. 11. Fig. 13. is a plan showing more clearly the arrangement of the adjusting studs for the annular folding bodies. Fig. 14. is a longitudinal section of one of the adjusting studs and the accompanying parts. Fig. 15. is a side elevation showing the method of supporting the bar for depressing the plungers supporting the cans. Fig. 16. is a sectional plan showing the means for depressing the plungers to receive the cans. Fig. 17. is a section to a larger scale showing the outline of the folding body at the part where the final fold is effected.

Referring to the accompanying drawings 1. indicates a suitable base or support within which is formed a chamber 2. designed to contain the gearing by which the parts are operated.

3. indicates a cover for the chamber just referred to, which chamber, in order to reduce friction between the respective gear wheels, may be filled with oil.

Formed upon the bottom of chamber 2. is a boss 4. Figs. 1 and 3 and which boss is perforated for the passage of a pin 5. secured in a vertical position by means of the nut 6. The pin 5 has at its upper end an eye bolt 7 by which the machine may be lifted, which bolt has upon it a collar 8. The collar 8. bears against the upper end of the short conical sleeve 9. which fits upon the conical upper end of pin 5. as shown in Fig. 3. Freely mounted upon pin 5. is a sleeve 10 which sleeve at its lower end is provided with a flange 11. to which is bolted or otherwise secured a pinion 12. by which, as will be hereinafter described, motion is transmitted to the sleeve 10. The sleeve 10. at its upper end is provided with a second flange 13. recessed into the boss of the disk 14. which disk is secured to the flange in any convenient manner, as by bolts or the like. The pinion 12. just above referred to, and shown by dotted lines in Figs. 1 and 2 and in full in Figs. 3, 7 and 8, is in gear with a pinion 14. mounted upon a spindle 15. supported at its ends by the bottom of the chamber 2. and cover 3. of said chamber. The pinion 14. is also in gear with a pinion 16. secured to the lower end of a spindle 17.

for which bearings 18, 19 are provided upon the bottom of chamber 2. and the cover 3. thereof as shown in Figs. 1 and 3. The pinion 14. has an extension to which is attached a pinion 20, both the pinion 14 and pinion 20 being revoluble independently of their supporting spindle. Also mounted upon spindle 15. is a pinion 21. forming part of a miter wheel 22. The miter wheel 22 is in gear with and operated by a second miter wheel 22^a mounted upon the end of a spindle 23. which spindle is mounted in suitable bearings, one only of which 24. is shown in Figs. 7 and 8, and to the outer end of which is secured a pulley for a belt whereby motion is transmitted from a suitable motor. The pulley is not shown upon the drawings but its application will be readily understood by those versed in the art.

25. indicates a spindle supported at its lower end by a bearing 24. and at its upper end by the cover of the chamber 2. Freely mounted upon spindle 25. is a pinion 25^a having secured to it a pinion 26. The pinion 25^a is in gear with pinion 20. while the pinion 26 is in gear with pinion 21 and motion is thus imparted by pinion 20 to the pinions 12 and 16 with which as aforesaid the pinion 14 is in gear. The various pinions just referred to are indicated by dotted lines in Fig. 2.

Mounted upon and secured to spindle 17 is a sleeve 27 having connected to it at its upper end a disk 28. provided with a peripheral wall 29 in which are formed a series of recesses 30 see Figs. 1, 2, 3 and 4. The recesses are of approximately semicircular outline, and in combination with a second series of recesses 30^a in the wall of a second disk 28^a, they surround the can and retain it in its desired position ready for presentation to the folding or seaming bodies. The second disk 28^a is mounted upon the upper end of a sleeve 28^b on a spindle 28^c carried at its lower end by a bracket 31 bolted or otherwise secured to the table 1. The bracket just referred to is shown in Figs. 1 and 3 of the drawings and in order to support it a flange 32 is formed upon table 1. The sleeve 27 mounted on spindle 17 has attached to its lower end a disk 33 having a peripheral wall 34 after the manner of disk 28 aforesaid, but of less depth. The wall 34 has formed in it a series of recesses 35 which recesses at their outer ends are rounded or curved so that as shown in Fig. 5 the disk presents somewhat the appearance of a gear wheel of very coarse pitch adapted to engage a succession of circular bodies following a circular path, the diameter of the circle being greater than the diameter of disk 33.

36 indicates a disk attached to the lower end of the sleeve 28^b on spindle 28^c which disk as shown in Fig. 3 is recessed in a similar manner to the disk 33.

The disks 33 and 36 respectively operate, and are operated by the circular casings 37 attached to the annular body 38. Each of the casings 37 contains a hollow plunger 39 see Fig. 3 supporting a pin 40, the pin at its lower end resting upon an antifriction device so that it is free to rotate with a minimum of friction. The body of the plunger is reduced in size forming a collar at the upper end which is of such dimensions that it is freely movable within the casing 37. Encircling the body of the plunger is a spring 41 which at its upper end abuts against the under surface of the collar upon the plunger and at its lower end bears against the bottom of the casing through which the plunger itself passes. The tendency of the spring is to lift the plunger, the upper end of which is thus movably held in contact with the undersurface of the annular body 38 supported from the annular body 66 as hereinafter described, and to which the casing is secured, and which thus forms a closure for the said casing. Secured to the lower end of the plunger 39 is an angle plate 42 carrying at its lower end a roller 43 which roller, as will be presently described during a certain period in the rotation of the annular body 38, comes into contact with an angle plate 44 by which it is forced down against the action of the spring 41 see Figs. 15 and 16. The angle plate just referred to is supported at one end by the bracket 31 see Figs. 1, 3, 15 and 16 to which it is secured by means of the brackets 44^a. At its opposite end the plate 44 is inclined upward as shown at 44^b Fig. 15 such inclined portion projecting into the path of the roller 43, which roller passes thereunder and it, and the plunger to which it is attached are depressed to permit the can to be placed upon the plate 48. The inclined end of the plate 44 is supported by means of a second bracket 44^c bolted to the said angle plate and to one of the brackets 49 as shown more clearly in Figs. 15 and 16. The angle plate 42 at its outer surface is in contact with the inner surface of a plate 45 secured to the lower end of the casing 37 which plate prevents the independent rotation of the plunger 39. The lower ends of the casings 37 are each secured to a ring 46 Figs. 1, 3, and 6 supported upon a roller 47 arranged at or near the center of the length of plate 44 aforesaid and mounted in a support attached to the bed 1 see Figs. 3, 6, 11 and 12. The support just referred to comprises a bracket 47^a bolted to the bed plate and bored to receive a pin 47^b having a pin 47^c arranged eccentrically with regard to the center of the pin 47^b. By this means upon rotating the pin the vertical adjustment of the roller may be readily effected in order to insure its proper contact with the horizontal portion of ring 46. The pin 47^b

after adjustment is secured by the stud 47^a tapped into the bracket 47^a. By this means the rings 38 and 46 are relieved from the strain that would otherwise be thrown upon them when the plungers 39 are forced downward against springs 41. The casings and with them the body 38 to which they are attached are free to rotate, their movement being effected by the disk 33 which as aforesaid is provided with peripheral recesses 35 which engage the casings 37 as clearly shown in Fig. 3. The body 38 and casings 37 thus in effect form a pin wheel actuated by the disk 33 and with which pin wheel is also engaged the recesses in disk 36 which consequently partake of the movement of disk 33 and thus drives the disk 28^a co-operating with disk 28 to feed the cans forward to the seaming bodies. As before stated each of the plungers 39 supports a pin 40 and each pin has at its upper end a plate 48 adapted to support a can. It will be understood that there are a number of the casings 37 together with plungers 39, these parts have, however, for the sake of simplifying the drawings, been omitted from Figs. 1 and 3, in the former figure being indicated by the vertical dotted lines *x*.

Arranged at suitable intervals apart upon the table 1 are brackets 49 Figs. 1, 2, 3 and 6, which brackets at their upper ends are connected to stays 50 which stays at their upper ends are secured to the sleeve 9 upon the upper end of the pin 5. The brackets are provided at 51 with a horizontal projection to which is bolted an annular body 52 which serves to support the folding bodies 53, Figs. 1, 2, 3, 6, 9, and 10. The body 52 at its periphery is provided with a vertical flange 53^a and at 55 with a slot adapted to engage the heads of the bolts 56 by which plates 57 are secured in position. The plates 57 are of L shaped section and as shown in Figs. 13 and 14 they project over the annular body 53 which is slotted to receive the ends of the studs 53^b tapped into plate 57 and which studs form guide pins for the said annular folding body. The plate 57 is shown in dotted lines in Fig. 13. Interposed between the ends of the plates 57 and the flange 53^a are springs 58 against which bear the ends of studs 59 tapped at their inner ends into the plates 57^a. The plates 57^a are contained within channels formed on plates 57 and each are provided with a projected portion 57^b which projects over and rests upon the annular body 53 and is clamped thereon by means of the plate 57 aforesaid. By this means a very nice adjustment of the folding bodies concentrically to the center of the pin 5 may be effected. The body or bodies 53 are suitably shaped at their inner edge to effect the desired seaming or folding of the upper end of the can and the closure therefor, and in order

to hold the metal up to the folding edge of body 53 there is provided a number of rollers 60, Figs. 1, 2, 3, 6 and 9, which rollers are provided with three circumferential flanges 61, 62, 63 of which 61, 62 are disposed so that they rest against the upper and lower surfaces of the disk 14. The flanges 62, 63 are designed to act in conjunction with the folding bodies 53 as shown in Figs. 9 and 10. The rollers are thus held against vertical displacement upon one side by the disk 14 and upon the other by the folding body 53. As however it is necessary that the body or bodies 53 be discontinued for a short distance to enable the cans to be introduced, some means of support is requisite to take the place of the said body, and in order to overcome this difficulty there is provided a curved plate 64 Figs. 3 and 6, which is arranged at a point adjacent to the disks 28, 28^a and which thus forms a bridge piece, its inner edge engaging the rollers so that their vertical displacement is prevented. The rollers are disposed within the upper end of the cans, indicated by dotted lines *w* in Figs. 3 and 6, and rest upon the closures, which are placed in position on the can prior to the introduction of the cans into the machine. Thus the cans are placed upon the plates 48 on pin 40 and the pins and plungers 39 are forced upward by springs 41 against the underside of the rollers 60 which rollers move with them and rotate as the cans themselves are rotated in their passage around the bodies 53. The plungers during the placing of the cans in position upon plates 48 are held down by the engagement of roller 43 with angle plate 44 as already described with reference to Fig. 6. The can when thrust up by the spring 41 is between the disks 28, 28^a which disks it will be noted have formed in the recesses 30, 30^a undercut portions 30^b which are designed to receive the enlarged portion or mouth of the can in which the lid is placed. The disk 28^a has formed at the upper end of its recesses a lip 28^a see Fig. 3. and as the cans are pushed upward, this lip turns the upper edge of the can in somewhat so that the action of the bodies 53 is facilitated.

The rollers 60 are each bored upon their upper surfaces and engaging the said bore is a pin 65. Antifriction balls are provided at the lower end of the pin Fig. 3, and at its upper end the said pin is attached to an annular body 66, Figs. 1, 2, 3, 9, 10 and 11, which thus serves to keep the various rollers properly spaced, and to which body are secured the upper ends of the vertical rods 66^a attached to the ring 38 and by means of which the said ring is supported and with it the casings 37 and ring 46 attached to the said casings.

In operation the cans with the closures in the mouths are placed upon the plates 48

which at this point are in their lowest positions. The cans are carried forward and come between the disks 28, 28^a and are then received in the recesses of the disks by which
 5 they are accurately placed with regard to the rollers. The cans are then thrust upward and as they move upward, one side of the top of the can is bent inward somewhat, preparatory to engaging the folding body.
 10 The cans next move onward until they encounter the folding body 53 whereupon the folding of the metal is effected, the first operation being that shown in Fig. 9, the can during the said operation rolling around together with the roller 60 and plate 48. The
 15 length of the body 53 or that portion of it performing the first folding operation, is sufficient to insure the full rotation of the can in order to completely turn over the
 20 edge all around. When this has been effected the can is subjected to the next folding operation which completes the folding and the can with the closure therein is carried clear of the folding bodies and is lowered ready
 25 for removal from the machine.

Obviously although the folding bodies are described as presenting an outline adapted to form two folds, the said bodies may be shaped to form more than two folds if so
 30 desired.

Having now particularly described the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

35 1. A can closing machine comprising a fixed annular body formed in two parts, one of said parts having its inner edge suitably formed for bending the metal, while the other forms a connection between the ends
 40 of the first part and forms a bridge piece, rollers having peripheral projections adapted to coact with the said annular body and disposed in the interior of the closure, means for pressing the rollers against the peripheral
 45 wall of the closure, said means coacting with the annular body to support the rollers, spring pressed plungers carrying supports for the cans, and moving in a circular path concentrically to the annular folding body,
 50 means for depressing the plungers against the springs, means for receiving the cans and presenting them to the folding body and the rollers coacting therewith.

2. A can closing machine comprising a
 55 fixed annular body formed in two parts, one of said parts having its inner edge suitably formed for bending the metal, while the other forms a connection between the ends of the first part and forms a bridge piece,
 60 rollers having peripheral projections adapted to coact with the said body and disposed in the interior of the closure, means for pressing the rollers against the peripheral wall of the closure, said means coacting
 65 with the annular body to support the rollers,

means for maintaining the rollers at a proper distance apart during their rotation, spring pressed plungers carrying supports for the cans, and moving in a circular path concentrically to the annular folding body, 70 means for depressing the plungers against the springs, and means for receiving the cans and presenting them to the folding bodies.

3. A can closing machine comprising an
 75 annular body formed in two parts of which one forms a bridge piece, said annular body being adjustably mounted upon a support carried by brackets mounted upon the base plate of the machine and having upon the
 80 inner circumference of one portion thereof, a projecting lip adapted to bend the material at the mouth of the can, rollers having peripheral projections designed to coact with the said lip upon the annular body, 85 and disposed within the interior of the closure, a revolving disk driven through gearing and engaging said rollers between other peripheral projections thereon whereby in conjunction with the lip aforesaid and
 90 bridge piece said rollers are supported, a ring carrying pins engaging the holes formed in the rollers whereby the proper spacing of said rollers is maintained during their rotation, spring pressed plungers con- 95 tained within casings attached to an annular body supported from the ring for spacing the rollers, pins revolvably mounted in said plungers and provided with plates for supporting the cans, a roller upon each
 100 plunger, a plate adapted to engage said roller to depress the plunger, means for counteracting the downward thrust of the plate, means for effecting the movement of the can supports and means for receiving
 105 the cans and presenting them to the folding body and roller coacting therewith.

4. A can closing machine comprising an
 110 annular body formed in two parts, of which one forms a bridge piece, said annular body being adjustably mounted upon a support carried by brackets mounted upon the base plate of the machine and having upon its inner circumference of one portion thereof a projecting lip adapted to bend
 115 the metal at the mouth of the can, rollers having peripheral projections designed to coact with the said lip upon the annular body, and disposed within the interior of the closure, a revolving disk driven through
 120 gearing and engaging said rollers between other peripheral projections thereon, whereby in conjunction with the lip aforesaid and bridge piece, said rollers are supported, ring carrying pins engaging holes formed in the
 125 rollers and whereby the proper spacing of said rollers is maintained during their rotation, spring pressed plungers contained within casings attached to an annular body supported from the ring for spacing the
 130

rollers, pins revolubly mounted in said plungers and provided with plates for supporting the cans, a roller upon each plunger, a plate adapted to engage said roller to depress the plungers, means for counteracting the downward thrust of the plate, a disk having a depending wall in which is formed semicircular recesses adapted to engage the plunger casings and mounted upon a sleeve upon a shaft driven by gearing from the main shaft, a second disk also recessed and

adapted to engage the casings and thereby transmit motion to a sleeve upon a second spindle, disks upon each of the sleeves having semicircular recessed walls and designed to receive the cans and present them to the annular body and the rollers coacting therewith. 15

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