C. ROBERTSON.

CAN FILLING APPARATUS.

APPLICATION FILED SEPT. 16, 1909.

979,096. Patented Dec. 20, 1910.

4 SHEETS—SHEET 1.

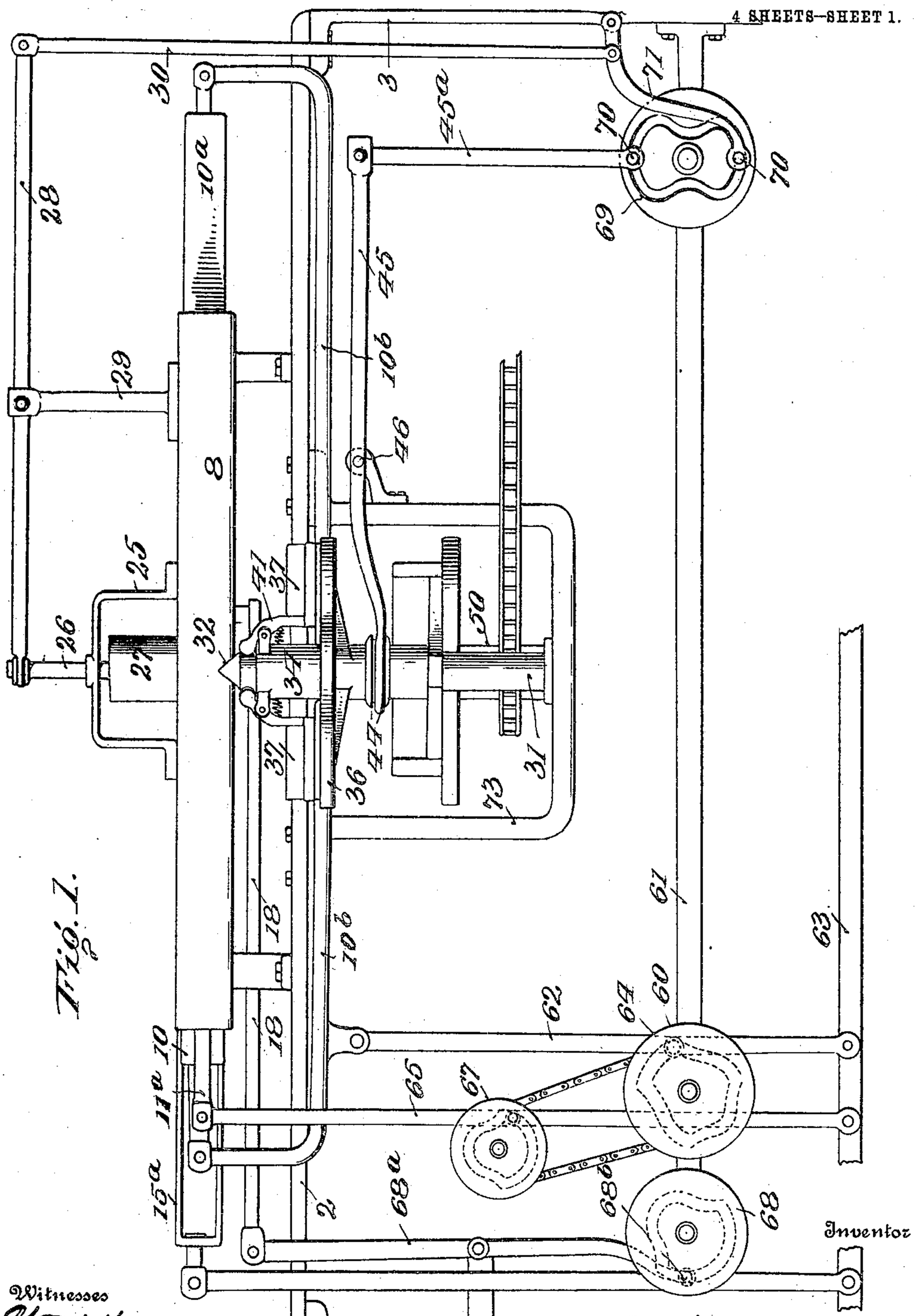

Fig. 1.

Witnesses

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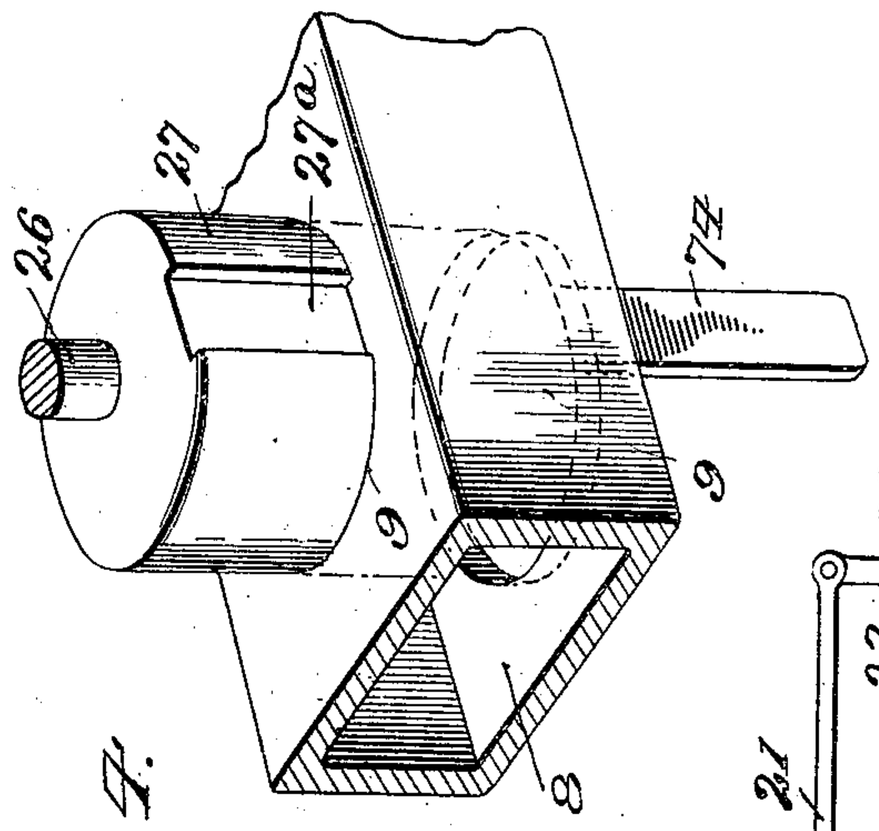

Fig. 4.

Fig. 2.

Witnesses

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4 SHEETS—SHEET 3.

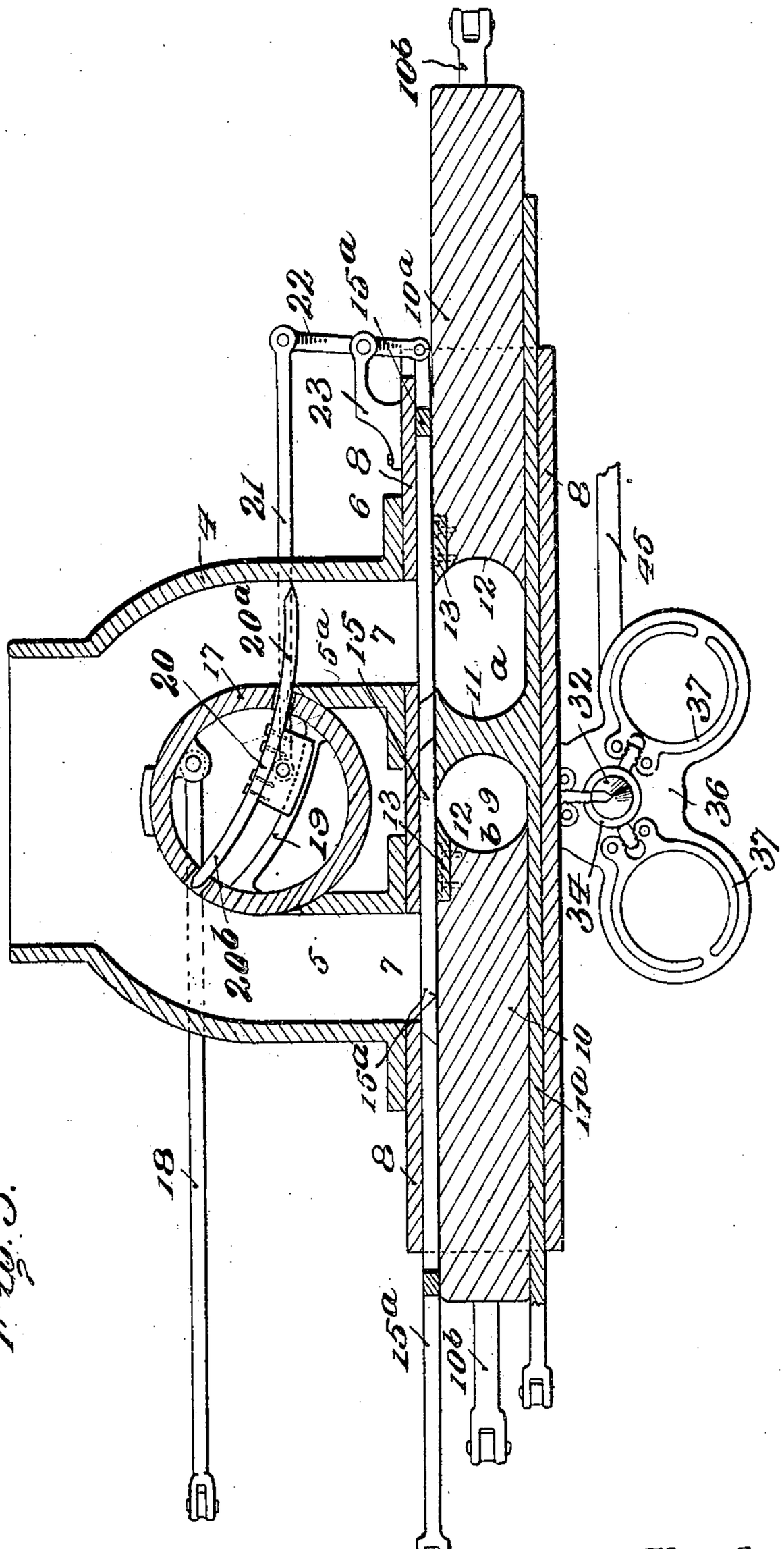

Fig. 3.

Witnesses

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4 SHEETS—SHEET 4.

Fig. 5.

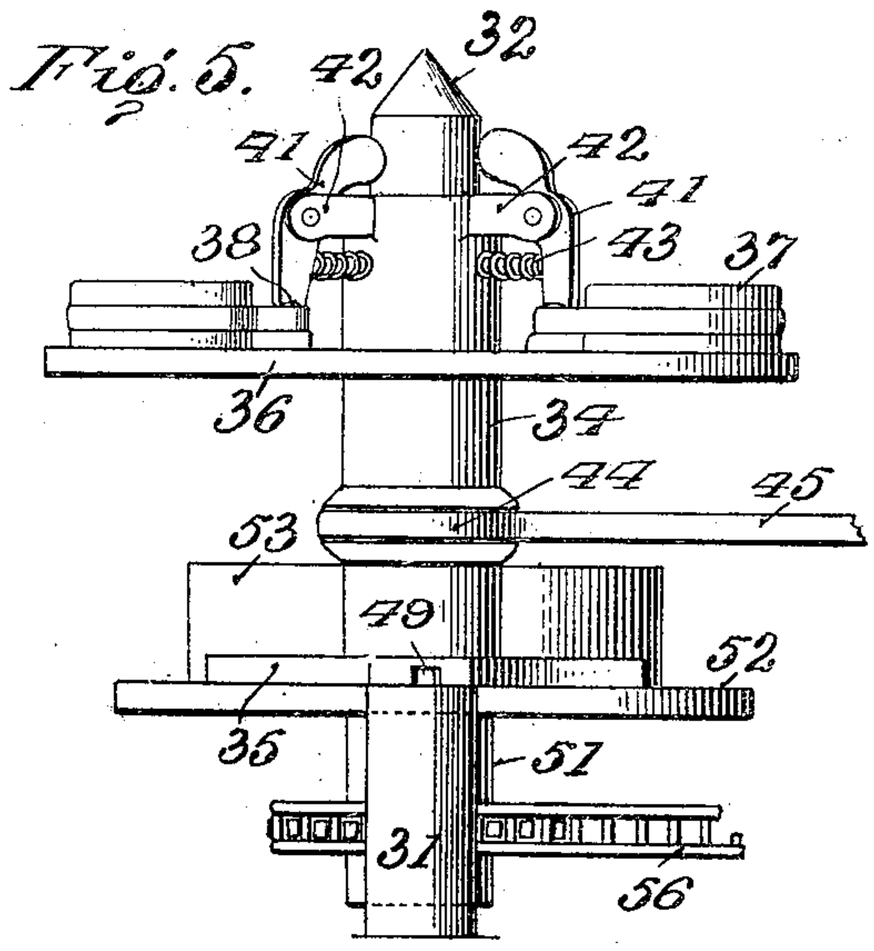
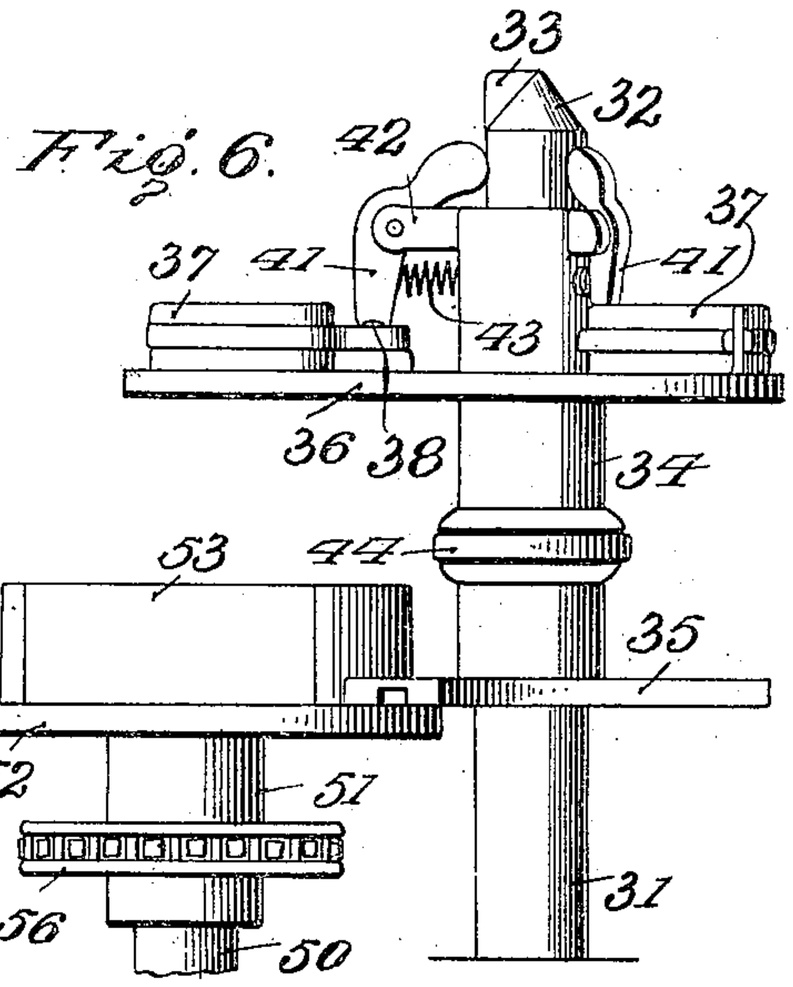


Fig. 6.



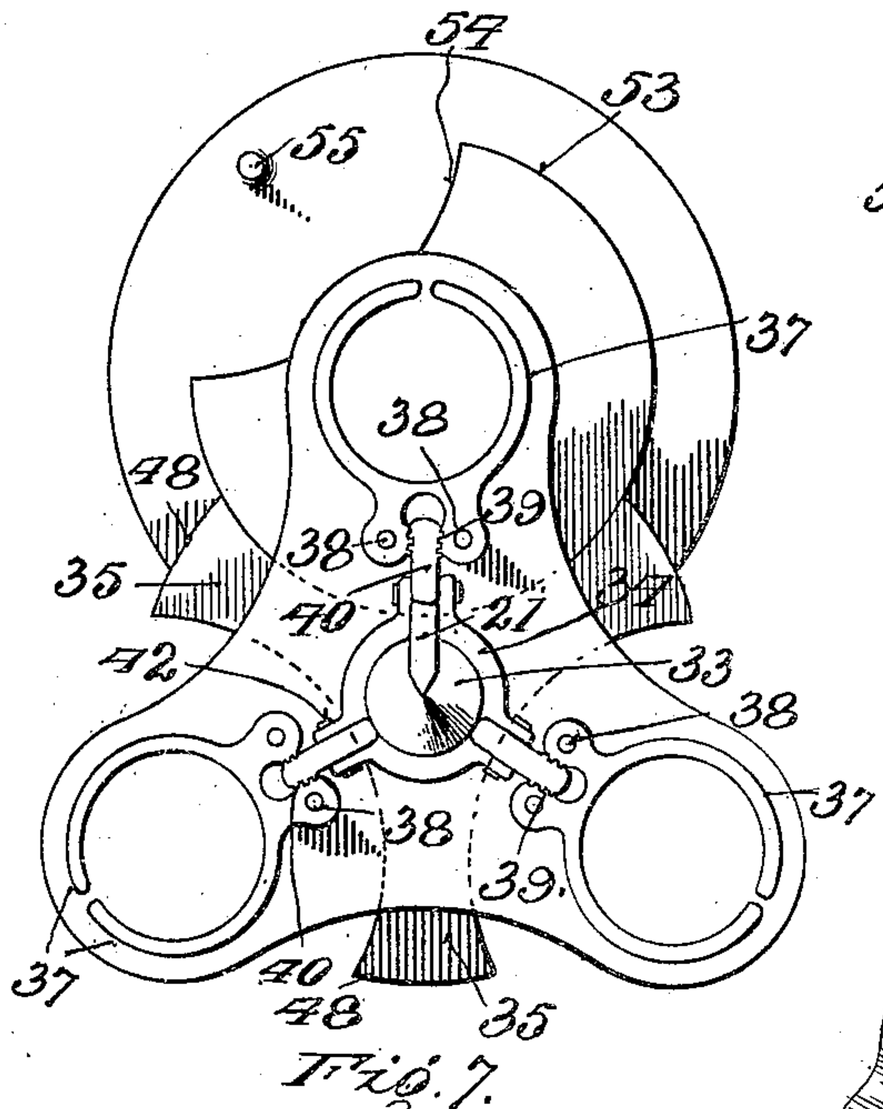


Fig. 7.

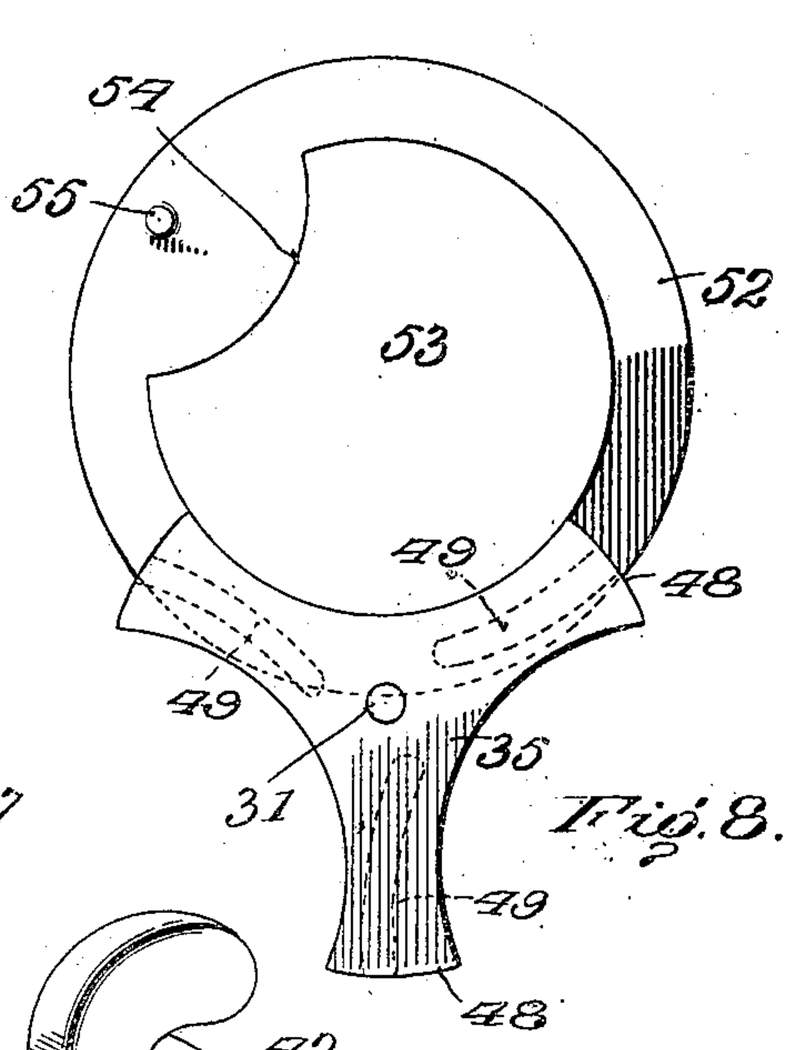


Fig. 8.

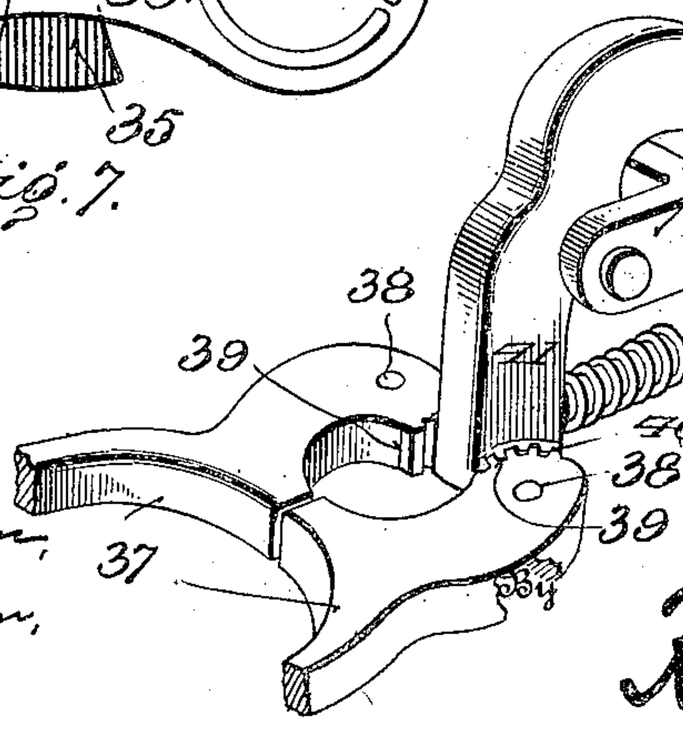


Fig. 9.

Witnesses

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UNITED STATES PATENT OFFICE.

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CAN-FILLING APPARATUS.

979,096. Specification of Letters Patent. Patented Dec. 20, 1910.

Application filed September 16, 1909. Serial No. 518,095.

To all whom it may concern:

Be it known that I, CHARLES ROBERTSON, citizen of the United States, residing at South Bellingham, in the county of Whatcom and State of Washington, have invented certain new and useful Improvements in Can-Filling Apparatus, of which the following is a specification.

This invention relates to canning apparatus, and particularly to means for filling cans, the apparatus being designed for canning fish, though not limited to this use.

The object of this invention is to provide an apparatus of this character, wherein pieces of fish previously cut up, shall be forced or directed into a compressor, compressed into the general shape of a cylindrical can, and forced into the can, the apparatus also including means whereby the escape of air within the can is limited, and whereby the cans to be filled are presented in regular order beneath a plunger opening, whereby they are forced out of the compressing chamber and into the can, the cans being withdrawn from the opening after being filled, and presented to an operator to be withdrawn from the machine.

For a full understanding of the invention and the merits thereof, and to acquire a knowledge of the details of construction, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a side elevation of my machine; Fig. 2 is a plan view thereof; Fig. 3 is a horizontal section thereof; Fig. 4 is a detail perspective, enlarged, of the plunger and a portion of the compressing casing; Figs. 5 and 6 are side elevations of the can-supporting mechanism; Fig. 7 is a plan view of the construction shown in Fig. 5; Fig. 8 is a like view, but with the can-carrying arms removed; and, Fig. 9 is a fragmentary detail, enlarged, of the means for operating the can clamps.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Any suitable supporting frame or table 2 may be used, mounted upon the supports 3, and upon which table is mounted the horizontally arranged hopper 4 having the diverging branches or passages 5 and 5^a. This hopper and its branches are horizontal, and the branches merge into each other by a semicircular curve, as will be seen in Fig. 3. The ends of the branches are flanged, as at 6, for attachment to an elongated casing 8, rectangular in cross section, into which the branches open, as at 7, the middle of the casing being formed with opposed alining round openings for the passage of a plunger to be later described. These openings 9 are located midway between the discharge openings or branches 5 and 5^a.

Slidably mounted within the casing 8 which forms a compressing chamber, are the three compressing slides or blocks 10, 10^a and 11. The slide block 11 is arranged in the middle of the casing, and the compressing blocks 10 10^a on each side thereof. The blocks or slides 10 and 10^a each have a concave or semicircular recessed end 12, and the side face of the end of each slide is rabbeted for the accommodation of a knife plate 13 attached thereto by screws. The middle block 11 is transversely concave on both faces, the concavity being less than a semicircle, as is the concave end of each of the blocks 10 10^a. It will be seen from Fig. 3 that the outer portion of the block 11 extends beyond the inner portion of the block, so that when one of the blocks 10 or 10^a is moved into its nearest position with relation to the block 11, there will be a space between the inner end of the block 11 and the knife 13. This is for a purpose to be hereafter described.

It will be seen from Fig. 3 that the slides or blocks 10 10^a are narrower than the width of the casing 8, so that a knife 15 may be reciprocated between the casing and the faces of the blocks 10 10^a and 11 and across the discharge openings 7 of the branches 5 and 5^a, while the space between said sliding blocks and the outer wall of the casing is just sufficient to accommodate a slide bar 11^a, to the middle of which the middle block 11 is attached, and with which it moves. The two end slides 10 and 10^a are connected to each other by a rod 10^b which extends longitudinally beneath the table and has the opposed upwardly turned ends to which the reduced extremities of the slide blocks are pivotally connected. Thus, the two slides 10 10^a are reciprocated together, and the inner ends of the blocks are held in a fixed spaced relation to each other. The block 11 is slidably mounted in the space between the ends of the blocks 10 and 10^a and, as before remarked, is reciprocated by means of the

slide bar 11ª. The range of movement of the middle block 11 is such that it alines with the inside edge of either one of the discharge openings 7, while its other face alines with the margin of the plunger opening 9. It will thus be seen that one compressing space between the ends of the outer sliding blocks and the adjacent face of the middle block is nearly a complete cylinder, while the other compressing space into which material is being received is elliptical.

The knife 15 is double-edged and is reciprocated across the openings 7. It will be seen from Fig. 3 that the knife also cuts across the compressing spaces, and in one position forms one side of said compressing space. The knife cuts the cylindrical compressing space so that the material packed therein is not in the form of a true cylinder, but is flattened on one side, so that when the material is forced into a can, a space is left at one side of the can through which air may pass. If the material was compressed into the form of a true cylinder having the diameter of the can, and the material was then forced into the can, it would probably include with it a certain amount of air, which air could not escape. By having the knife 15 cut across one side of the cylinder of material, space is left when the material is placed in the can, whereby air may readily escape. The knife 15 is supported upon a reciprocating frame 15ª. The means for reciprocating this frame and the connections to the slide blocks will be later described.

As a means of forcing the material fed into the hopper into the compressing chamber or space, I provide at the junction of the inside faces of the branches 5 and 5ª the rotatable ring 17. This ring is so mounted as to have an oscillatory rotary movement, this rotary movement being given to the ring by a reciprocating bar 18 connected as will be later described. The circumferential wall of the ring 17 is slotted at opposed points, and a slightly concave inner wall 19 is formed in connection with the ring 17, this wall extending from one slot to the other, and forming a curved guide face for a curved feeding fork 20. This member 20 has two opposed forks, one adapted to operate in one of the branches, and the other in the other branch. It has a reciprocating sliding movement in the ring 17, and to this end is connected to a reciprocating bar 21 which is connected to a reciprocating lever 22 pivoted to the frame 15ª. This lever has its fulcrum on a bracket 23. Thus, a reciprocation of the frame 15ª will reciprocate the link 22 which will shift the bar 21. This construction provides that the ring 17 shall be rotated through an arc of a circle and that just before it reaches the end of its movement in one direction, the reciprocating bar 21 shall be operated to withdraw the fork 20 from one of the passages or branches and shall project the opposite end of the fork into the opposed branch, where it engages with the material in the hopper. Upon a reverse movement of the ring 17, the fork will be moved in the arc of a circle inward toward the compressing chamber, forcing the material along the passage and into the compressing chamber. When the ring 17 has reached the end of its movement in this direction, the fork is withdrawn and inserted into the outer end of the opposed passage, as before described. It will thus be seen that the fork is moved inward along the passage to feed the material, is then withdrawn entirely, moved out again to the entrance to the passage, is again projected, and is again moved forward. Mounted in a stirrup 25 attached to the inner face of the casing 8 or in any other suitable support, is the plunger rod 26 which carries at its inner end the plunger 27 adapted to pass through the plunger openings 9 and into the space between the inner face of either slide block 10 or 10ª and the adjacent face of the block 11, to force the material contained in the compressing space outward and into a can. The extremity of the plunger rod 26 is shown as connected to a lever 28 pivoted on a standard 29, the extremity of the lever being connected to an operating rod 30 whose connections will be later described.

As a means of supporting moving cans into place between the lowermost plunger opening 9 and into position wherein the material being canned may be easily forced into the can, I provide the vertical cylindrical standard 31 which is rigidly supported in any suitable base and projects up to a point slightly above the lower face of the casing 8. The upper end of this standard is conical, as at 32. It is provided with the outwardly projecting triangular lug 33 which is directed toward the compressing casing 8. The outer face of the triangular lug 33, it will be seen, is co-incident with the cylindrical outer face of the shaft 31, the upper end of the lug 33 being in alinement with the apex of the cone 32. Surrounding the standard 31 is the sleeve 34 which is shiftable vertically upon the standard. The lower end of this sleeve carries a member 35 having a plurality of radial arms, whereby the sleeve 34 shall be rotated by mechanism to be hereafter described. The upper portion of the sleeve 34 is formed with a table 36 having a plurality of arms upon whose upper faces the cans to be filled are arranged to be supported. Pivoted upon the upper face of each of these arms is the pair of opposed can-clamping members 37 which are adapted to almost surround the can when closed, and to hold the can rigidly in the clamp. The rear ends of these clamping

members or jaws 37 are pivoted, as at 38 to the face of the table 36, and each of the rearward extensions of the jaws 37 is formed with a series of teeth 39 which are arranged in the arc of a circle surrounding the pivot pin 38. These teeth are arranged upon the inside face of the rear ends of the jaws 37 and are therefore opposed to each other and adapted to mesh with a rack 40 having opposed teeth. This rack is carried upon an arm 41 pivoted in ears 42 projecting from the upper end of the sleeve 34. There are, of course, as many of these arms 41 as there are pairs of can clamps 37. Springs 43 force the lower ends of the arms 41 outward, and thus tend to hold the clamping jaws 37 in their open position. When, however, the upper ends of the arms 41 are forced outward, it will be obvious that the lower ends of the arms will be drawn inward against the force of the springs 43, and that thereby the clamps 37 will be closed upon a can. The upper end of the cylindrical standard 31 acts to hold the upper ends of the arms 41 forced outward and the clamping jaws in engagement with the can. Hence when the sleeve 34 is raised so that the upper ends of the arms 41 pass over the conical end 32, it will be obvious that the springs 43 will force the lower ends of the arms outward and that the jaws will therefore be opened. It will also be obvious that it is necessary that one of the pairs of clamps shall not be opened when grasping between them the can that is being filled and that is to be raised into position immediately beneath the plunger opening 9. The lug 33 is for this purpose. While the upper ends of the other arms 41 of the pairs of clamps are moving inward and the clamps opening, that arm 41 which is attached to the clamp holding the can to be filled, is not moved, for the reason that its upper end contacts with the outer face of the lug 33. As a means of raising the sleeve 34, I form it with a groove along its length, in which is carried a ring 44, this ring being pivoted to the bifurcated end of a shifting rod 45 which is pivoted at its middle, as at 46, and has a downwardly turned link 45^a engaged by any suitable mechanism for reciprocating the rod 45. It will be seen that the reciprocation of the rod 45 will raise the sleeve 44, and this will raise all the cans carried upon the table 36, and particularly will raise that can which is supported beneath the plunger or can-filling opening.

As before stated, there are a plurality of can-supporting arms. Hence it is necessary to give to the table a step-by-step rotary movement to bring each can in turn beneath the filling opening 9. For this purpose I provide the standard 31 with the gear 35. This gear has as many arms upon it as there are cans to be filled. The extremities of the arms are rounded as at 48, and the arms have curved outside faces which merge into each other. The under face of the gear is provided with the three slots or grooves 49 which are parallel to the adjacent curved face of the arm. Mounted upon any suitable rotatable support or shaft 50 is a collar 51 carrying upon it the rotatable disk 52 having projecting from its upper face a block 53. This block consists of a portion of a cylinder from which a section has been cut away, as at 54, the section thus cut away leaving a concave recess in the side of the block 53. Upwardly projecting from the face of the disk 52, midway between the cusps of the block 53, is the pin 55, which pin is so located that upon a rotation of the disk 52, the pin will enter the slots 49. The outer faces of the arms 35 have a curve which fits the curvature of the outer face of the block 53, as shown in Fig. 8, so that as the block rotates with the disk 52, the gear 35 will be held from any turning movement, but when in the course of the rotation of the disk 52, the pin 55 enters one of the slots 49, the gear 35 will be rotated through the third of a circle, the slightly curved inner ends 48 of the arms contacting with the curved recess 54. It will thus be seen that the gear 35 is held from any accidental movement in any direction, and that it can only be moved by engagement with the pin 55, and that this pin will rotate the gear 35 a certain portion of a circle, depending upon the number of can-supporting arms 36. If there are, for instance, three can-supporting arms, it will be obvious that the sleeve 34 must be moved a third of a complete circle at each rotation of the disk 52, while if there are, for instance, six can-supporting arms, it will be obvious that the sleeve 34 will have to rotate a sixth of a complete circle for one rotation of the disk 52.

While I do not wish to be limited to the precise manner by which I secure the step-by-step rotation of the clamp-supporting arms, yet I regard this form of gear for the purpose, as preferable, for the reason that it holds the can-supporting arms absolutely rigidly in position with one of the cans in alinement immediately beneath the can-filling opening 9, and that during the whole period of the rotation of the cans, the can-supporting arms are held rigidly so that there is no lost motion and no back motion, and there is no chance for a can to get out of alinement with the plunger opening and thereby be damaged and the contents of the can be injured by the descent of the plunger with the can out of alinement therewith. In order to provide for the vertical reciprocation of the sleeve 34, I make the block 53 relatively deep so that it will have a contact with the arms 35, whether the arms are elevated or lowered. A sprocket chain 56 engages with a sprocket wheel on the collar

51 to continuously rotate the disk 52 in one direction, but I do not wish to be limited to this means of rotating the disk.

It will be obvious that I may use a large variety of different mechanisms for securing the different correlative movements of the various elements of my apparatus, and I do not wish to be limited to any particular means to this end, but as an operating means for the mechanism, I have illustrated a cam wheel 60 which is rotatably mounted upon a transverse bar 61 supported on the frames or legs 3 of the machine. Pivoted to the reciprocating rod 10^b is a lever 62 which is pivoted at its lower end to a longitudinal rod 63 mounted in the standards 3. The lever 62 is engaged, at its middle, by a pin 64, with the crank disk 60. A rotation of the cam disk, it will be seen, will reciprocate the lever 62 whose upper end will reciprocate the rod 10^b, thus giving a reciprocating motion to the compressing plungers or slide blocks 10 and 10^a. A like reciprocation, but in the opposite direction, is given to the rod 11^a by means of a lever 65 pivoted at its lower end to the cross bar 63 and connected to a cam disk 67. The rotation of the cam disk will reciprocate the lever 65, reciprocating the rod 11^a and the middle compressing block 11. The rod 18 which is connected to the oscillating ring 17 may be either independently operated, or may be connected as shown, that is, operated by a lever 68^a operated by the cam 68, the pin 68^b moving in advance of the pin 64 so that when the compressing blocks 10 and 10^a are at one end of their path of travel, and the compressing chamber has been opened at the discharge end of one of the passages 5 or 5^a, then the ring 17 will be rotated as before described. The fork 20 is carried into the opposed chamber at the same time that the compressing blocks or plungers begin their initial movement to bring a compressing space before the other of the discharge passages. The plunger must of course be lowered as the can-carrying mechanism is raised, and as a simple means of achieving this end, I provide the cam wheel 69 having the diametrically opposed cam pins 70, one of which engages with the downwardly turned end of a lever 71 which is connected by the link 30 to the lever 28 of the plunger. The other of these pins projects from a link 45^a pivotally connected to the lever 45, said lever being pivoted to the ring 44 as before described. Preferably a frame 73 is attached to the under side of the table 2 and extends down beneath and supports the lower end of the standard 31 and the standard 50.

As before stated, the knife 15 cuts off a portion of the cylinder of material so that the material shall not quite fill the can, but so that a space may be left extending down along the inside face of the can, through which the air may escape from the lower strata of fish or other packed material. It will be obvious that unless provision is made, the descent of the plunger into the can will compress the fish so as to entirely fill the can, and thus the purpose of the knife 15 will be nullified. In other words, this space within the can must be kept there, and to this end, I provide a blade 74 which projects down from the under side of the casing 8 at the middle of the same, in alinement with the can-filling opening 9. When the can moves upward into position in registry with the opening 9, this blade will extend down along the inside of the can, and the material will be compressed into the can, and then upon the withdrawal of the can, by reason of the lowering of the can table 36, the space extending downward along the side of the can will be left vacant. It will be obvious that the plunger is cut away on one side, at 29^a, to accommodate this blade 74.

The operation of my apparatus is as follows: Assuming that the parts are in the position shown in Fig. 3, and both branches of the hopper are filled with slices of fish or other matter to be canned, the first part of the machine to be moved is the rod 18. This, in its lateral reciprocation, rotates the ring 17 in the arc of a circle. This forces the fork 20^a downward, thus feeding the slices of fish in the branch 6^a into the compressing space or chamber *a* formed between the adjacent faces of the block 10^a and the block 11. When the fork 20^a has reached its lowest point, the knife 15 is forced across the branch 5^a and at the same time, the compressing block or slide 10^a is moved inward, (the block or slide 10 moving outward or toward the block 10^a at the same time). This compresses the material in the space *a* into an approximate cylinder, the knife 15, in conjunction with the blade 13 slightly cutting open one side of the cylinder to a depth of about one-eighth of an inch. All of the blocks 10, 10^a and 11 are now shifted laterally, bringing the compressed cylinder of material into registry with the plunger openings 9 (the inner end of the compressing block 10 being now in alinement with the outer margin of the branch 5). As this occurs, the rod 30 is actuated to move the lever 28 and force in the plunger 27. Coincident with this, and slightly before the plunger operates, the table 36 has been rotated to bring a can beneath the plunger opening 9, and when in position, the lever 45 is operated to raise the sleeve 34 and the can table to bring the mouth of the can against the under side of the casing 8. As this occurs, two of the can clamps of the set of clamps mounted on the rotary table 36, are opened,—one to release a filled can and permit it to be removed, and the other to receive an empty can from an operator.

As soon as the can to be filled is in place, the plunger 27 is operated to force the compressed material out of the case 8 and into the can. While this is occurring, the fork 20[b] of the feeder 20 is moving downward to feed the material into the compressing space, and the operation above described is repeated upon this last named side of the machine.

It will be seen that my mechanism as described provides an apparatus wherein the cans are continuously fed to the machine and continuously filled, the compression of the material occurring on alternate opposite sides of the can-filling opening, and the material within being moved to the center of the compressing casing and forced out through the central can-filling opening. It will be seen that while one can is being filled, the material is being compressed for the next following can. Thus, there is no delay in the apparatus, and cans are filled practically upon each reciprocation of the plunger 27.

I do not wish to be limited in any manner to the means for reciprocating the various parts of the apparatus. I have shown crank wheels for this purpose merely as an indication of a means for operating the parts, but it will be obvious that cams may be used, or that various different mechanical elements are capable of accomplishing reciprocation of the various parts as described. Any mechanic can arrange means for accomplishing the reciprocation of these parts coördinately and in their proper time. Neither do I wish to be limited to the precise details of construction as shown in the several figures, inasmuch as the spirit of my invention may be embodied in many different constructions, without departing therefrom.

Having thus described the invention, what I claim is:—

1. In can filling apparatus, a compressing chamber, opposed relatively movable compressing members, means for moving said compressing members toward one another, means for forcing the compressed material from between said compressing members, and means for shifting both of said compressing members with their compressed charge to said second named means.

2. In can filling apparatus, a compressing chamber, movably supported compressing means including an independently movable compressing member, means for operating said compressing means to effect compression of the material, means for shifting said compressing means with its compressed charge, and means arranged for ejecting the compressed material from said compressing means after it has been shifted by said last named means.

3. In canning apparatus, the combination with a hopper, of a compression chamber into which the hopper opens, relatively movable compressing members arranged to compress between them the material received from said hopper, said members being supported for movement toward and from one another and for movement both in the same direction, means for operating said members to effect a compressing operation and a subsequent shifting thereof with the compressed material, and an ejecting means at one side of the discharge from said hopper for ejecting the compressed material from between said compressing members.

4. In can-filling apparatus, a compressing chamber having an inlet and a discharge opening, opposed relatively movable compressing members adapted to compress between them the material to be canned, means for moving the compressing members toward each other, means for shifting both of the compressing members in the same direction into registry with the discharge opening in the compression chamber, and means operating through the discharge opening to force out the cylinder of compressed material.

5. In can-filling apparatus, a compression chamber having an intake opening and a discharge opening located out of registry with each other, opposed relatively movable compressing members adapted to compress between them the material to be canned, means for moving the compressing members into alinement with the walls of the intake opening, means for holding the compressing members with the compressed material between and moving both of said members together in one direction to bring the compressed material into registry with the discharge opening, and a transversely operating plunger passing through the compressing chamber and adapted to force the cylinder of compressed material out of the discharge opening.

6. In can-filling apparatus, a compression chamber having an intake opening and a discharge opening, opposed relatively movable compressing members adapted to compress between them material received through the intake opening, said members having concave opposed ends, a knife whose path of movement is across the intake opening, means for moving the compressing members both in one direction to bring the cylinder into registry with the discharge opening, and a plunger acting to force the compressed material out of the discharge opening.

7. In can-filling apparatus, a compression chamber having an intake and a discharge opening, opposed relatively movable compressing members adapted to compress between them the material received through the intake opening, said compressing members being concave on their inner faces, one

limb of the concavity of each of the compressing members being cut away so that the compressing members when together will not inclose an entire circle, but that the material to be compressed will project out beyond said members, a knife movable across the faces of the compressing members to cut off said projecting portion of the material, and a plunger operating transversely to the compressing members and acting to force the compressed material out through the discharge opening of the chamber.

8. In a canning apparatus, a compression chamber having an intake and a discharge opening, opposed relatively movable compressing members adapted to compress between them the material received through the intake opening, said compressing members being concave on their inner faces, one limb of the concavity of each of the compressing members being cut away so that the compressing members when together will not inclose an entire circle, but so that the material to be compressed will project out beyond said members, a knife movable across the faces of the compressing members to cut off said projecting portion of the material, a blade attached to the face of the compression chamber and projecting therefrom at the margin of the discharge opening, said blade being adapted to fill a segment cut from the cylinder of compressed material when the material is forced into movement, means for raising a can into position beneath the discharge opening, and means for forcing the compressed material out of said discharge opening into the can.

9. In canning apparatus, the combination with a hopper, of a compression chamber into which the hopper opens, relatively movable compressing members adapted to compress between them the material received from the hopper, said members being movable toward each other, movable away from each other, and movable both in the same direction, said casing having opposed plunger openings at one side of the discharge from the hopper, and a plunger movable through the plunger openings.

10. In canning apparatus, the combination with a hopper and a compression chamber into which the hopper opens, said compressing chamber having opposed openings located at one side of the hopper opening, of opposed compressing members, said members being movable toward each other and into alinement with the discharge opening from the hopper, movable both in the same direction to bring them into alinement with the opposed plunger openings, and being movable in opposite directions to separate them, and a plunger operating transversely of the compressing members and adapted to force out the compressed material through the side of the casing.

11. In canning apparatus, the combination with a hopper having two branches leading therefrom, and a compressing chamber into which said branches open, of opposed compressing members located in the compressing chamber, a central movable abutment in the compressing chamber between the opposed compressing members, means for moving the abutment from the inside margin of one of the branch discharge openings to the inside margin of the other, means for alternately reciprocating the opposed compressing plungers to and from the central abutment, and a discharge plunger operating transversely to the compressing plungers and located between the two branches of the hopper.

12. In a filling device, a hopper having a curved portion merging into a straight tangential portion, an oscillating rotatable support forming one wall of the curved portion of the hopper, a feeding member extending radially through said support and carried thereby, said feeding member having a transverse shifting movement relative thereto, means for oscillating the support, and means for projecting the feeding member into the hopper at the beginning of the curved portion thereof and withdrawing the feeding member at the junction of the curved portion of the hopper with the tangential portion.

13. In a filling device, a curved hopper, an oscillating rotatable support forming a portion of one wall of the hopper, a curved feeding member carried by said support and projecting radially therefrom, said member having a transverse shifting movement relative to its support, means for oscillating the support, and means for projecting the feeding member into the hopper at the beginning of its movement toward the discharge end thereof and withdrawing the feeding member at the termination of its path of movement toward the discharge opening.

14. In a filling device, a curved hopper, an oscillating rotatable support forming a portion of one wall of the hopper, said oscillating support being slotted, a feeding member sliding transversely through said slot and adapted to be projected into the hopper, said member being outwardly bent toward the mouth of the hopper, means for oscillating the support, and means for projecting the feeding member into the hopper at the beginning of the movement of the support toward the discharge opening of the hopper and withdrawing the feeding member from the hopper on the termination of said movement.

15. In a filling device, a curved hopper, an oscillating rotatable support forming one wall of the hopper, said support being slotted, a curved feeding member carried in

said slot and adapted to be projected out into the hopper, means for guiding the feeding member in an arcuate path in said support, a reciprocating connecting rod pivotally connected at one end to the rotatable support for oscillating the same, a reciprocating rod connected to the feeding member for projecting and withdrawing the same into and out of the hopper, and means for moving the last named rod in either direction after the first named rod has completed its movement in either direction.

16. In a filling device, a hopper having a curved portion merging into a straight portion extending tangentially to the curved portion, an oscillating rotatable support forming a portion of the inside curved wall of the hopper at the point of junction of the curved portion with the straight portion, said support being slotted, a feeding member slidingly carried in said support, said feeding member being curved away from the delivery mouth of the hopper, mechanism pivotally connected to the support to rotatably oscillate the same, mechanism connected to the feeding member for oscillating the same, and guideways carried by said support in which said feeding member slides.

17. In a filling device, a hopper having opposed diverging discharge branches, a rotatable oscillating support mounted between the branches and forming the inside walls thereof, a double feeding member carried by said support, sliding transversely therein, and thereby adapted to project into one or the other of the branches, and means for oscillating the support and for alternately shifting the feeding member laterally into one of the branches and withdrawing it from the other.

18. In a filling device, a hopper having two diverging branches, said branches being curved, an oscillating cylindrical rotatable support forming the connecting wall of said branches, a transversely sliding feeding member carried in said support and adapted to be projected into one or the other of the branches or withdrawn therefrom, means for rotatably oscillating the support, and means for projecting the feeding member into one of the passages at the commencement of the movement of the rotatable support toward the discharge end of said passage and withdrawing the feeding member from said passage and projecting it into the other of said passages at the beginning of the return oscillation of the support.

19. In a filling device, a hopper having diverging curved branches extending therefrom, a rotatable cylindrical support mounted between the branches at the junction thereof with the hopper and forming the connecting wall of said branches, said support being slotted at opposed points, a curved web formed within the support and extending from one slot to the other, a curved sliding member fitting against the curved web and having opposed forks projecting from it, adapted to pass through said slots and into one or the other of the passages, and means for rotatably oscillating the support and projecting one of said forks into one of said passages upon the beginning of the movement of the rotatable support toward the discharge end of the passage and for sliding said feeding member transversely across the support to project the other fork into the opposed passage when the first named fork has reached the end of its path of movement toward the discharge end of the first named passage.

20. In a canning apparatus, the combination with a chamber having a discharge opening, of a rotary table, a plurality of can clamps mounted on the table, means for giving the table a step-by-step rotation to bring the can clamps in turn beneath the discharge opening of said chamber, and mechanism for raising one of the cans into contact with the side of the chamber, while holding the clamps thereof closed, and simultaneously opening the other clamps to permit the removal and insertion of cans into said clamps.

21. In canning apparatus, the combination with a chamber having a discharge opening, of a rotatable table, a rotatable shaft connected to the table, means for clamping cans upon the table, a driven element mounted on the shaft, having a plurality of rearwardly projecting arms, and a driving element including a rotatable disk having a pin thereon adapted to engage in succession with each arm of the driven element to turn the driven element through a portion of a revolution and then discharged therefrom, and means for holding the driven element from movement, after its disengagement from said pin.

22. In canning apparatus, the combination with a chamber having a discharge opening, of a rotatable table, a rotatable shaft connected to the table, means for clamping a plurality of cans upon the table, a driven element mounted on the shaft and having on its under side a plurality of radial grooves, and a driving element including a rotary disk having a pin projecting therefrom and adapted in the rotation of the disk to engage in succession in the slots in said driven element to turn the driven element through a portion of a revolution and withdraw from said slot, and means for holding the driven element from movement after its disengagement from the pin.

23. In canning apparatus, the combination with a chamber having a discharge opening, of a rotatable table, a rotatable shaft connected thereto, means for clamping a plurality of cans upon the upper face of the table, a driven element mounted on the shaft

and having a plurality of radially projecting arms, said arms being each provided with a radial slot, the outer faces of the arms being concavely curved and merging into each other, a driven element including a rotatable disk so mounted that its margin extends beneath the driven element, and having a pin upon its upper face adapted in the rotation of the driving element to engage in succession with the slots in the arms of the driven element, the upper face of said disk being provided with a circular hub whose outer face has a curve on the same radius as the concavity of the arms of the driven element, said hub being thereby adapted to contact with the sides of said arms and hold the arms from movement, said hub, at a point opposite the pin, being cut away to permit the arms to rotate while engaged with the pin.

24. In canning mechanism, the combination with a chamber having a discharge opening, of a rotary table, a plurality of pairs of clamping jaws mounted on the table, upwardly extending pivoted arms engaging with the jaws to open the same when the arms are moved in one direction and to close them when the arms move in the other direction, springs for forcing the arms outward at their lower ends to open the jaws, a central standard extending up through said table, said standard having a conical upper end, the upper ends of the clamp-actuated arms engaging with the outer face of the standard and being forced outward thereby in the normal position of the table, and means for raising the table so that the upper ends of the arms shall engage with the conical end of the standard and permit the springs to force the lower ends of the clamping arms outward.

25. In canning apparatus, a filling support for cans, comprising a cylindrical standard, conical at its upper end, but said conical end being provided with a lug projecting out therefrom, having an outer face alining with the cylindrical portion of the standard, a sleeve surrounding the standard and shiftable thereon, means for raising and lowering the sleeve, a table carried on said sleeve, a plurality of pairs of can-clamping jaws pivotally mounted on the table, a plurality of upwardly extending arms pivoted at the middle to the sleeve, the lower end of each arm being formed with a rack engaging with gear teeth formed on the inner extremity of the clamping jaws, the upper ends of the arms being inwardly turned to contact with the cylindrical surface of the standard, springs for forcing the lower ends of said arms outward when the upper ends of the arms are moved beyond the cylindrical portion of the standard, and means for giving a step-by-step rotation to the sleeve and table carried thereby.

26. In a filling device, a hopper, a circular, hollow, oscillating, rotatable support forming one wall of the hopper, a feeding member carried by said support and passing through the same, but having a transverse shifting movement relative thereto, means for oscillating the support, means for projecting the feeding member into the hopper at the beginning of its movement toward the discharge end of the hopper and withdrawing the feeding member out of the hopper and into the rotatable support at the termination of its path of movement toward the discharge opening.

27. In can filling apparatus, a hopper having spaced discharge branches, a rotatable support mounted between the branches of said hopper, opposed feeding devices movably mounted on said support for alternate projection into and retraction from respective branches of said hopper, means for operating said support for alternately moving said feeding devices through their respective branches of said hopper, and means whereby each feeding device is alternately projected and retracted by and during movement of said support.

28. In can filling apparatus, a hopper having spaced discharge branches, a rotatable support mounted between the branches of said hopper, opposed feeding devices movably mounted on said support for alternate projection into and retraction from respective branches of said hopper, means for oscillating said support, means connecting said feeding devices for simultaneous movement on said support, and means for adjusting said last means for effecting alternate projection and retraction of said devices, one being moved to its projected position while the other is being moved to its retracted position.

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

CHARLES ROBERTSON. [L. S.]

Witnesses:
HYLAND D. MCARTHUR,
SAMUEL E. LEITCH.