J. C. PORTER.

CAN FILLING MACHINE.

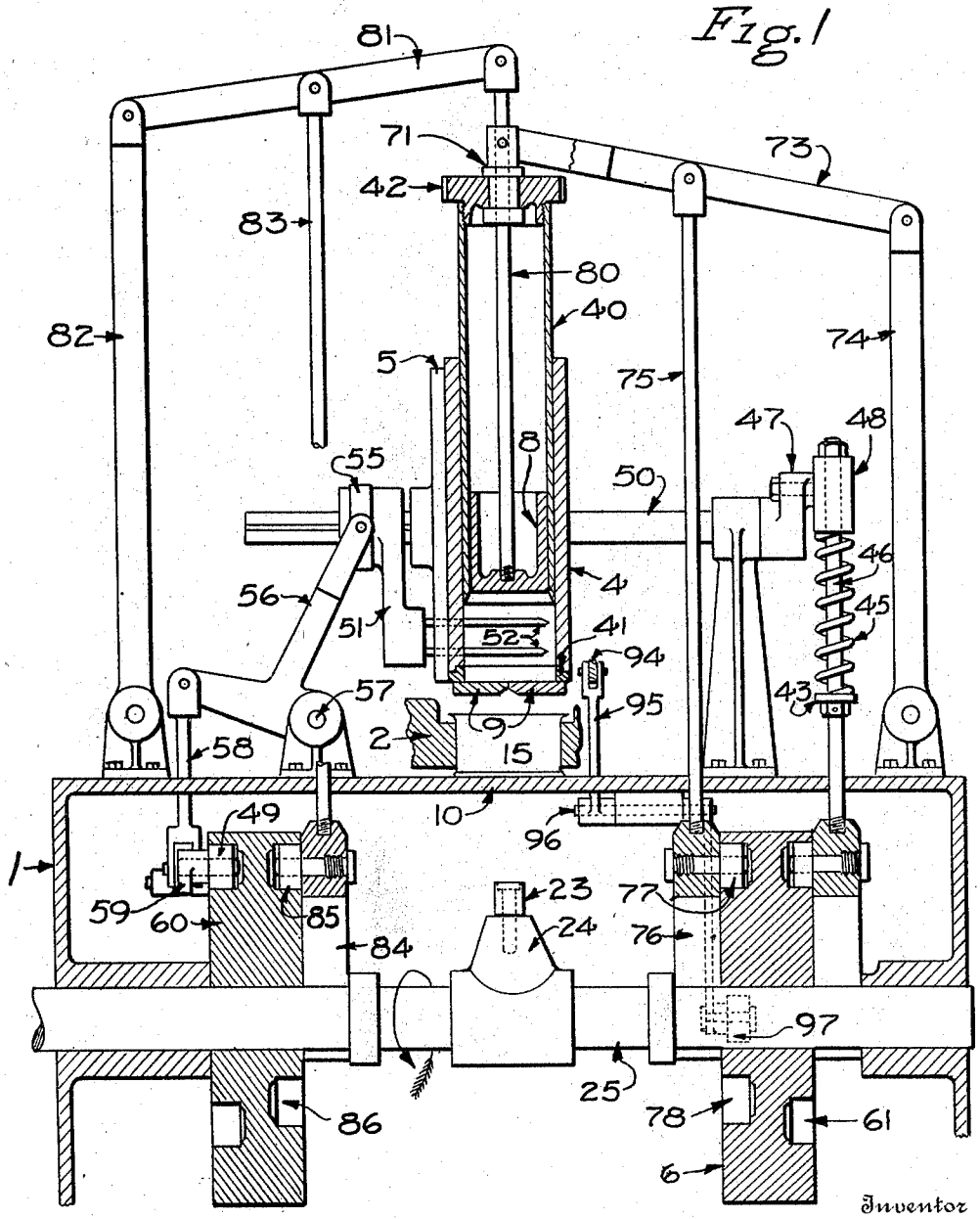
APPLICATION FILED APR. 5, 1918.

1,315,403.

Patented Sept. 9, 1919.

5 SHEETS—SHEET 1.

Fig. 1



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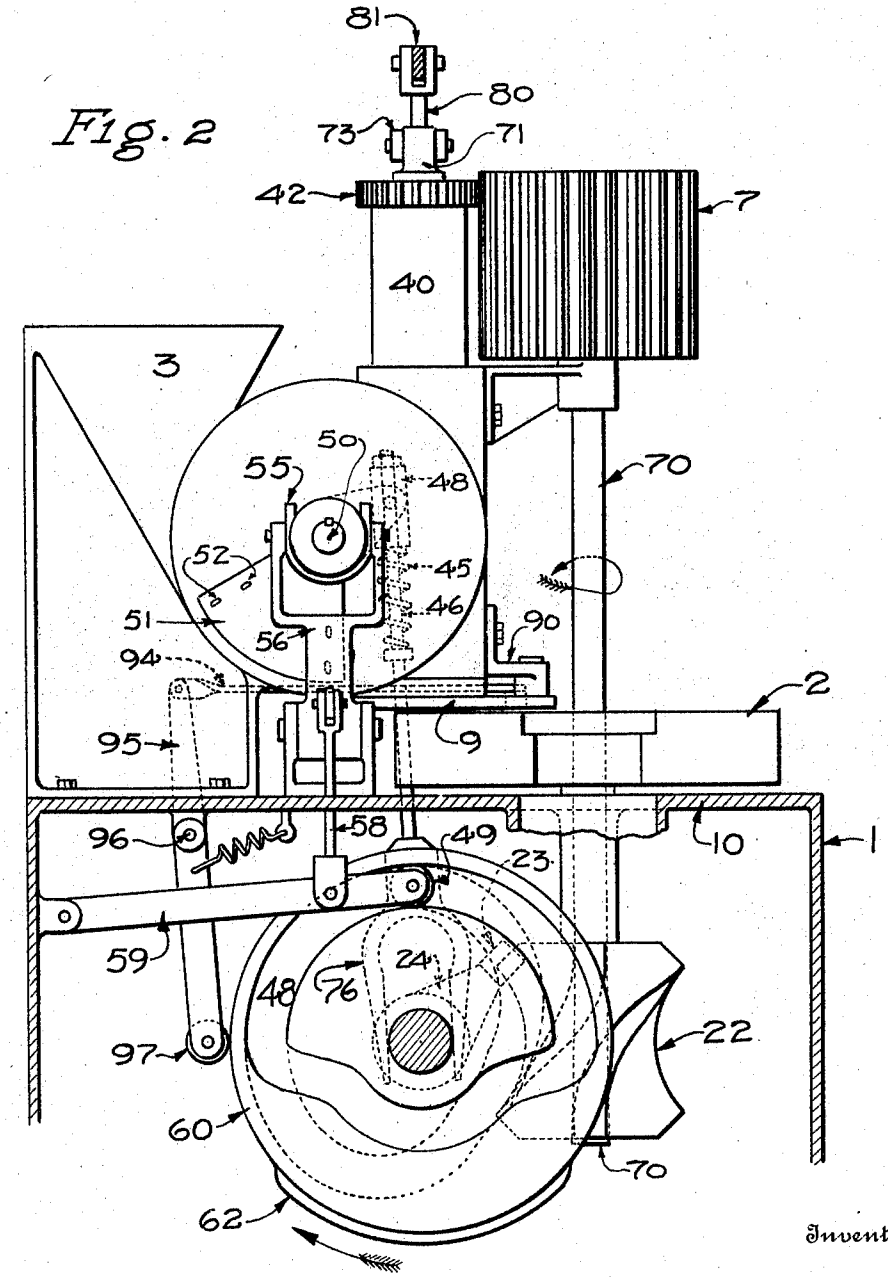
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5 SHEETS—SHEET 2.

Fig. 2



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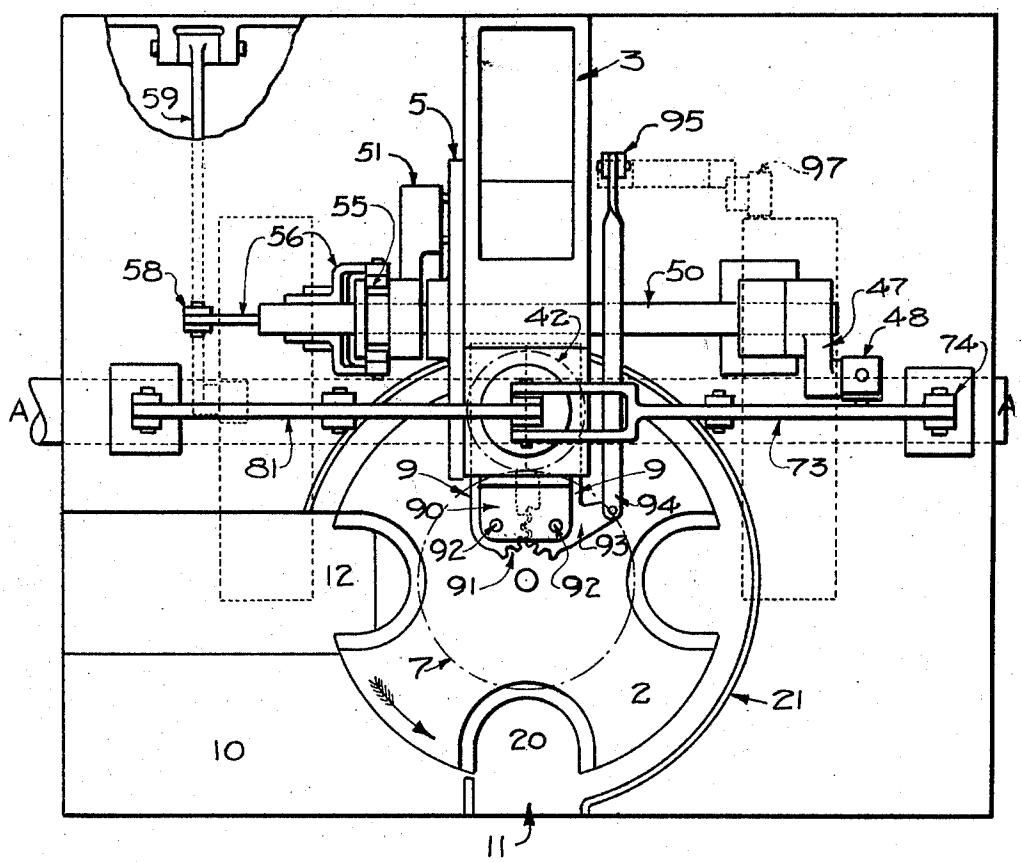
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5 SHEETS—SHEET 3.

Fig. 3



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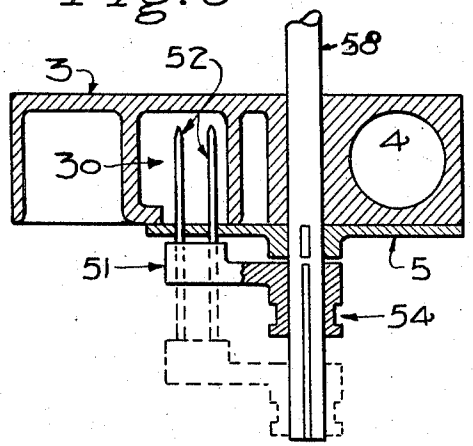
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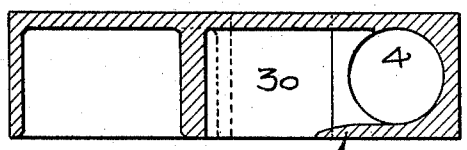
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Fig. 6



SEC. A A

Fig. 7



SEC. B B

Fig. 4

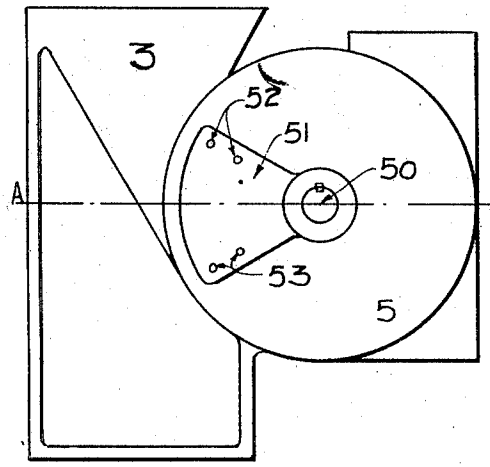
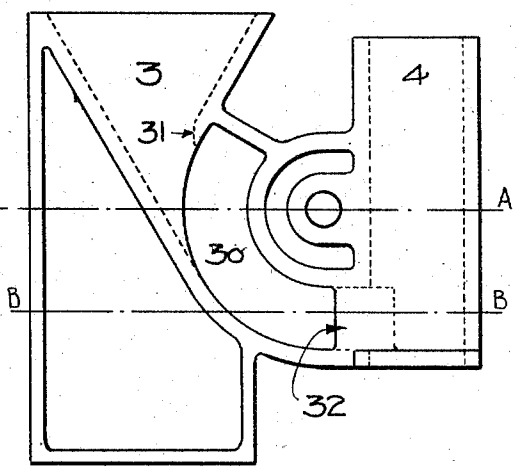


Fig. 5



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5 SHEETS—SHEET 5.

Fig. 8

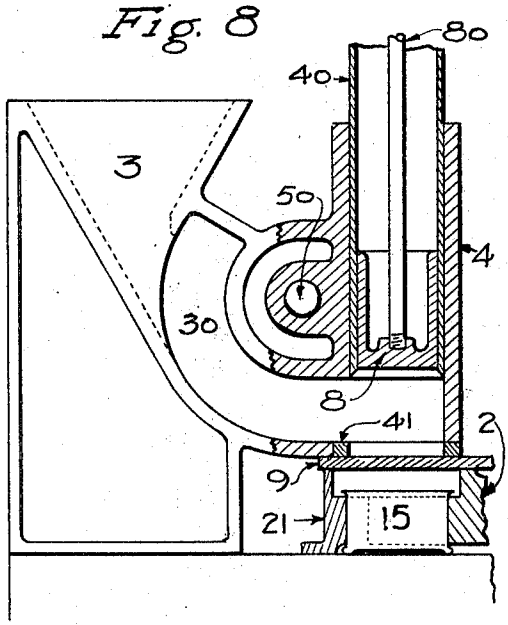


Fig. 9

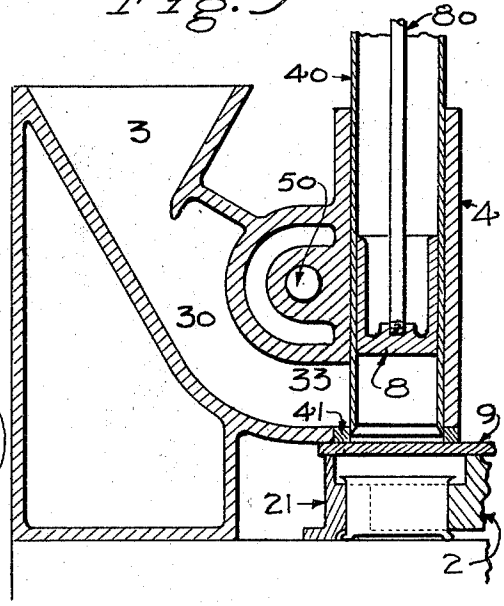


Fig. 10

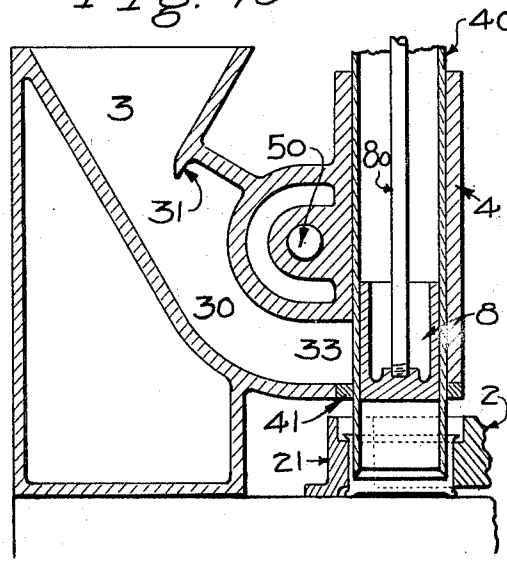
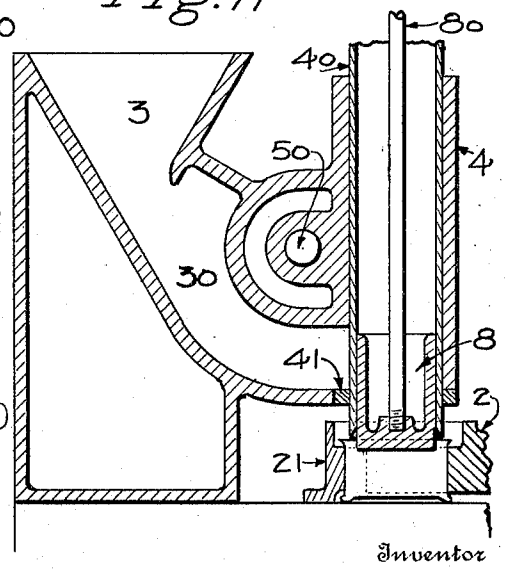


Fig. 11



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UNITED STATES PATENT OFFICE.

JAMES C. PORTER, OF SEATTLE, WASHINGTON.

CAN-FILLING MACHINE.

1,315,403. Specification of Letters Patent. Patented Sept. 9, 1919.

Application filed April 5, 1918. Serial No. 226,938.

To all whom it may concern:

Be it known that I, JAMES C. PORTER, a citizen of the United States, and resident of the city of Seattle, county of King, and State of Washington, have invented certain new and useful Improvements in Can-Filling Machines, of which the following is a specification.

My invention relates to can filling machines and particularly to machines employed in filling cans with fish, or similar products.

My invention consists of certain improvements in machines of this kind which will be herein described and then particularly pointed out by the claims.

The object of my invention is in general to insure a better result in the filling of the cans, both as to the even and complete filling of the cans and also in decreasing the mutilation of the fish.

One of the specific objects has in view the perfection of the device for cutting from the mass the exact amount required for the proper filling of the cans and the placing of this in the cans in such a way as to insure the solid placing of the fish at the bottom of the cans and the complete expulsion of the air from the bottom of the can.

Further objects of my invention may be seen from a study of the specification and the claims.

In the accompanying drawings I have shown my invention embodied in the form of construction which is now most preferred by me.

Figure 1 is a front sectional elevation taken through the filling position of the cans.

Fig. 2 is a side elevation of the machine.

Fig. 3 is a plan view.

Fig. 4 is a side elevation of the hopper and the means employed for the filling of the cans.

Fig. 5 is the same with the oscillating disk and fish feeding mechanism removed.

Fig. 6 is a section on the line A—A of Figs. 4 and 5.

Fig. 7 is a section on the line B—B of Fig. 5.

Figs. 8, 9, 10 and 11 are sectional elevations taken through the feeding and filling mechanism, showing these parts in different positions.

In the machine as herein illustrated, and which will be particularly described, I have illustrated mechanisms for accomplishing certain purposes which might be variously modified without in any way affecting the more essential features of my invention. I have, however, described this mechanism, it being understood that the means for operating certain of these parts within certain limitations, be varied as desired or found suitable, the same being well within the scope of my invention.

The frame 1, upon which the operating devices are mounted and by which they are supported, may be of any suitable construction. It is herein shown as having a flat top surface 10 upon which the cans are handled. The cans are fed to a revolving turret 2, having therein notches 20, each of which is adapted to receive a can, the same being surrounded for the greater part of its circumference by an inclosing band 21 which prevents the cans moving away from the center. This turret is of ordinary standard construction and may be replaced by any other suitable type of can feeding mechanism.

The shaft 70 of this turret is shown as provided with a cam device 22 which is in the general form of a worm such as is used for power transmission purposes. The wings of this worm are designed to be contacted by a roller 23 carried by an arm 24 which is secured to and turns with the main shaft 25. This secures a forward advancing movement of the turret at each revolution of the shaft 25. This forward movement of the machine shown is one-fourth of a circle. The cans are each fed in at the point 11, each being engaged by one of the notches 20 in the turret and are conveyed, in the direction indicated by the arrow, to the can filling position and then from this position are brought to the point 12 where they are discharged.

The fish which are to be placed in the can, are fed to the hopper 3. Prior to placing in the hopper they are supposed to be cut into suitable sized pieces for placing in the cans. The hopper 3 discharges into the upper end of the passage 30, which, in the main, is in the shape of a segment of an annulus. The upper end of this annulus is carried somewhat above and beyond a lip 31, which forms the downward edge of one side of the hopper. This forms a recess into which the fish

will not pass by ordinary feed from the hopper, leaving thus a clear space for the insertion of the feeding pins.

The annulus into which the fish are fed, is freely open at one outer face, excepting as to a portion of the tangential extension at its lower end, which tangential extension is covered by a wing 32. This tangential extension 33, merges into the lower portion of the casing 4 in which is mounted the cutting knife and the filling piston. This chamber 4 is herein shown as integrally cast with the hopper 2 and the annular segment 30. This is, however, a question of convenience of construction rather than a necessity of construction.

Mounted within the cylinder 4 is the filling tube 40. This has its lower end edges sharpened to serve as the chief member of the cutting device. The other member of the cutting device consists of a ring 41 which is inserted in the lower wall of the tangential extension 33 from the filling chute. The hole in this ring is of a size to exteriorly closely fit the cutting tube 40, so that when the tube enters the same they will act as two members of a shear to cut the fish. If these parts fit accurately and are kept in proper condition, they will cleanly cut through any portions of fish, so that the amount of fish which is contained within the tubular knife will be cleanly severed from the other fish.

A shaft 50 is mounted concentric with the annular segment 30. Upon this is secured a disk 5, which covers the opening in the side face of the annular segment and forms the outer wall thereof. Mounted upon the same shaft, so as to rotate therewith, but in such a manner as to be freely movable lengthwise of the shaft, is an arm 51, which arm consists of a circular segment and carries four feed pins, two of these, 52, being toward one edge thereof and the other two, 53, being toward the other edge thereof.

These pins are alike in construction and differ only slightly in their function and operation. These pins pass through holes formed in the disk 5, as is clearly seen in Fig. 6. The reciprocation of the arm 51 causes these pins to be either withdrawn from the annular chamber through which the fish is being fed, or inserted substantially to the bottom of this chamber.

With the segment arm 51 in the position shown in Fig. 4, the two uppermost pins 52 would be in position such that when reciprocated inwardly, or so as to project them through the holes in the disk 5, they will pass back of the lip 31, and thus enter a space which is not filled with fish, whereby they will not perforate the fish. It is desirable in the handling of the fish, to prevent mutilation of fish to the fullest extent possible. The other two fingers 53, which are at the lower side of the arm 51, would be passed through whatever particles of fish would be in their path.

With the arm 51 in its inner position, which is close to the disk 5, the pins 52 and 53 are inserted into the annular chamber into which the fish is placed. If the shaft 50 be rocked so as to swing the arm 51 downward and under the shaft, it will force whatever portions of the fish are engaged by these pins, downward and into the filling chamber. If this movement be made as a continuous reciprocating and oscillating movement, the supply of fish to the filling chamber will be maintained constant and the fish will be positively forced into this chamber so as to insure its being maintained full, and consequently, a proper filling of the cans.

The arm 51 is mounted upon the shaft by means of a key and feather, as is clearly shown in Figs. 1 and 6. The hub of the arm 51 is provided with a groove 54, in which is placed a yoke 55, which yoke is engaged by the yoke end of an arm, 56, which is pivoted at 57 and which is oscillated through a link, 58, which link is connected with arm 59 pivotally supported at one end upon the frame and at its other end carrying a cam roller 49, which enters a cam groove 48 in the side face of the disk 60. This disk is mounted upon the main shaft 25 and the cam groove is so proportioned that it will cause one reciprocating movement of the link 58 at each revolution.

The oscillation of the shaft is secured through the connection of an arm, 47, carried at one end thereof, with a link 46. This link is similarly actuated from the cam groove 61 in the face of a disk 6, also upon the shaft 25. This is designed to cause one oscillation of the shaft 50 at each rotation of the shaft 25.

To insure a certain flexibility, or give, in the movement of the arm 51, which would be required because of the possibility that the movement might otherwise be more than was necessary to insure the placing of the proper amount of fish in the filling chamber, I have inserted a yielding element in the actuating means for this shaft. This yielding element, as shown, consists of a spring 45 which is carried by the link 46, which link is mounted so that it is free to have a reciprocating movement within the block 48, which is directly pivoted upon the end of the arm 47.

The mechanism described is designed so that the operation of feeding the fish will be caused by a thrust movement of the link 46. The spring 45 is placed between a collar 43, which is adjustably secured upon the link 46 and the pivot block 48, so that the feeding movement is conveyed through the spring 45 and this spring may yield in case

the filling chamber is too full to receive all of the fish which might otherwise be fed thereto.

The means for operating the cutting knife 40 are as follows: To the upper end of the tube 40 is secured a pinion 42. This pinion meshes with the gear 7, which is long enough to maintain engagement during the reciprocation of the tube 40. This gear is secured upon a shaft 70 which at its lower end carries the worm or cam 22, which is actuated by means of the cam roller 23 carried by the rotating arm 24. In consequence of the intermittent movement of the worm 22 by the arm 24, the pinion 42 will be given a turning movement and cause a turning of the tubular knife 40.

The pinion 42 has a hole centrally placed therein, in which is mounted so as to freely turn, a spool 71, this having flanges, both at its upper and its lower end, to prevent reciprocating movement within the pinion 42, while still permitting free rotative movement. The spool 71 is pivotally connected with a yoke carried by the end of a lever 73, which lever is pivotally supported at its outer end upon an arm 74, pivoted at its lower end upon the frame. A link 75 is connected with the central portion of the lever 73 and at its lower end is provided with a yoke 76 which spans the shaft 25, to thus prevent a side swinging movement. A cam roller 77, carried by this link, enters a cam groove 78 formed in the side face of the disk 6. This cam groove is so shaped as to produce one reciprocation for each revolution of the disk. In this manner the tubular knife 40 is reciprocated to cut the desired amount of fish for insertion into the can. It is thus seen that the tubular knife is given a rotative movement through its connection with the gear 7 and at the same time a reciprocating movement through the links 73 and 75. The action of the cutting edge of the knife upon the fish is thus a sliding movement or draw cut, and its cutting action is thus improved.

Within the tubular knife 40 is the filling piston 8. This is mounted to reciprocate freely within the knife. It does not, however, turn with the knife. Its action would, however, be the same in effect, whether it did or did not turn. This piston has a stem 80 which extends through a bore centrally placed in the spool 71. The outer end of this stem connects with a lever 81 and the opposite end of this lever is supported from a link 82 which, at its lower end, is pivotally connected with the frame.

A link 83 is connected with the lever 81 and at its lower end is provided with a yoke 84, which spans the shaft 25 and carries a cam roller 85 which enters a cam groove 86 formed in the face of the disk 60. This causes one reciprocation of the piston 8 for each revolution of the shaft 25.

The chamber which forms an extension of both the segmental filled chamber 30 and the tubular knife 40, has a removable bottom which is in place while the chamber is being filled and which is removed when the filling charge of fish has been severed from the main mass and when the proper time comes for inserting the same in the cans. This bottom, as herein illustrated, consists of two plates 9 which are pivoted upon a ledge or bracket 90 and they extend side by side under the tube 4. The upper surface of these two plates 9 engage the lower edge of the ring 41. The outer end of the two plates 9 are provided with toothed segments 91, which intermesh, so that the two are compelled to move in unison and oppositely, when swung upon their pivots 92.

One of these plates carries an arm 93, which has a link 94 connected therewith, this link being connected with one end of a lever 95 which is pivoted at 96 upon the frame and which at its other end carries a cam roller 97, which engages with the periphery of the disk 60. This disk has a raised portion 62, so that it is given one reciprocation at each rotation of the disk. This causes the two plates 9 to swing away from each other and thus to remove the retaining bottom of the feeding chamber so that the material contained therein may be ejected into the cans.

In Fig. 1 the parts are shown in the position occupied when the knife and the piston are in their uppermost position. In this position the chamber beneath the knife has been filled with fish. The knife then goes down with a rotary movement.

Fig. 8 shows the position occupied by the parts when the knife begins to strike the fish. The piston 8 may or may not follow up with the knife and does not advance beyond the position shown in Fig. 8 until the cutting edge of the knife enters the ring 41, that is, until the fish to fill one can has been severed from the main mass. Fig. 9 shows this position of the parts. The two plates 9 are shown as held in place beneath the knife. They have acted to support and prevent discharge of the fish. At this point the mechanism for controlling these plates is actuated to swing them away from each other to thus permit discharge of the fish. A can 15 has been placed in position to receive its supply of fish.

The tubular knife 40 is slightly smaller than the inner diameter of the can and freely enters the can, at this time occupying the position shown in Fig. 10. The piston 8 has advanced with the tubular knife. Then the movement of the knife and the

piston change in such manner as to cause a relative withdrawal of the tube or advancement of the piston. The fish will thus be forced out of the tube. This occurs while the tube is still inserted in the can. In consequence, the fish is forced against the bottom of the can and the air has an opportunity to escape through the space between the tubular knife and the can. As the tubular knife 40 is raised the piston 8 is forced down a sufficient amount to insure that the fish be well seated upon the bottom of the can and below the top surface thereof. This position of the parts is shown in Fig. 11. The knife and the piston are then both raised to the point where the space occupied thereby may be filled with fish for the next can. At the same time the two plates or gates 9 are swung toward each other so as to stop the opening through which the fish is discharged.

What I claim as my invention is:

1. In a can filling machine, a tube having an end cutting edge located upon its outer periphery, a material receiving chamber having an opening the margin of which is adapted to act as a cutting member complemental to said tube, means for reciprocating said tube through said opening, means normally closing said opening, means for removing said closing means just in advance of the arrival of the tube, means for presenting cans to receive the projected end of the tube, and means for ejecting the material from the tube as it is withdrawn from the can.

2. A can filling machine comprising a tube having end cutting edges and adapted to serve as a device for determining the amount of material for filling a can, means for reciprocating the tube to carry it through and to project it beyond a mass of the material, means for presenting a can in position to receive the tube after it has thus received a filling charge and means for rejecting the material from the tube as the tube is withdrawn from the can to thereby fill the can.

3. A can filling machine comprising a tubular knife having end cutting edges, a chamber into which the material is fed, said chamber having opposite walls provided with holes through which said knife is mounted to reciprocate, means for presenting cans to receive the knife after it has passed through said chamber, and means for expelling the contents of said knife as it is withdrawn from the cans.

4. A can filling machine comprising a tubular knife having end cutting edges, a chamber into which the material is fed, said chamber having opposite walls provided with holes through which said knife is mounted to reciprocate, means for presenting cans to receive the knife after it has passed through said chamber, a piston within said knife and means for operating said piston to expel the contents of the knife as it is withdrawn from the can.

5. A can filling device comprising a tube having end cutting edges and adapted to act both as a knife and as a measuring device for the material, means for forming a mass of the material of a regular and determined thickness, means for reciprocating said tubular knife through said mass to separate therefrom a quantity to fill a can, means for positioning a can to receive the filled knife, and means for expelling the contents of the knife as it is withdrawn from the can.

6. In a can filling machine, a filling pocket having a semicylindrical bottom, a tubular knife guided by said bottom and having end cutting edges, means for reciprocating said knife lengthwise of and through said pocket, means for giving said knife a progressive turning movement with each reciprocation, and means for ejecting the contents of said tube during its withdrawal into the pocket.

7. In a can filling machine, a tubular filling pocket open at one side, a tubular knife having end cutting edges and reciprocating in said pocket as a guide, a cutting ring surrounding the lower end of said pocket and coöperating with said knife, means for reciprocating said knife to project it well through said ring, means for giving the knife a turning movement during its cutting stroke, and means for ejecting the contents of said tube at the beginning of its return movement.

8. In a can filling machine, a filling pocket having a semicylindrical bottom surface and a discharge opening at one end, a tubular knife member fitting and mounted to reciprocate along said cylindrical surface and having end cutting surfaces, means for reciprocating said knife member, a piston in said tubular knife member, and means for reciprocating said piston to conform with but lagging behind the reciprocation of the knife thereby to eject the fish at the beginning of the return movement of the knife.

9. In a can filling machine, a filling pocket having a semicylindrical bottom surface, means for feeding the material into said pocket, a tube fitting against said semicylindrical surface, and having its end edges sharpened to act as a knife, means for reciprocating said tube, means for turning said tube during its advancing movement, a ring at the bottom end of the filling pocket adapted to coöperate with the cutting edge of the tube to sever the material, and movable plates adapted to alternately close and open the orifice of said ring.

10. A can filling machine comprising a tubular member mounted to reciprocate and

having an end edge sharpened to form a knife, a piston mounted to reciprocate with and in said tube, a filling pocket through which said other members reciprocate, means for intermittently closing the exit opening for said tube and means for placing an empty can in position for receiving the tube after it passes through said exit opening.

11. A device as in claim 10 having the outer diameter of the tube enough smaller than the inner diameter of the can to permit free escape of the air therefrom.

12. In a device as in claim 10, means for separately reciprocating the tube and the piston to cause the movement of the piston to lag behind the movement of the tube.

13. In a can filling machine, a filling pocket, means for intermittently forcing the material into said pocket, a tubular filling knife having end cutting edges and mounted to reciprocate through said pocket, a discharging piston within the tube, a movable gate adapted to close the opening from the filling pocket through which the tubular knife projects, means for supplying a can to receive the projected end of said knife and means for coöperatively securing the successive movements of said parts.

14. In a can filling machine, a supply hopper, a filling pocket and transfer passage connecting the two, said passage having one open side, a closing plate for said open side mounted to reciprocate between the hopper and the filling pocket and feeding fingers mounted to reciprocate through and with said plate.

15. In a can filling machine, a supply hopper, a filling pocket and an arcuate transfer passage connecting the two, said transfer passage having one side open, a plate covering said open side and mounted to oscillate about the central axis of said passage, feeding fingers passing through said plate and reciprocating therewith, and means for reciprocating said fingers in an axial direction to withdraw them from the transfer passage on the return movement of the plate and to then insert them for the feeding movement.

16. A feeding device for can filling machines comprising a transfer passage having an open side, means for supplying fish to one end of said passage, said end having a flange extending inward to maintain an open or unfilled space behind it, a plate covering the open side and reciprocating lengthwise the passage, feeding fingers movable laterally with said plate and also lengthwise to insert them in the open space behind said flange and to withdraw them at the other end of the passage.

17. A can filling device comprising a hopper for receiving the material, an arcuate transfer passage extending in a vertical plane from the bottom of the hopper and having one side open, and a filling pocket receiving the material from said transfer passage, a shaft occupying the axis of said arcuate passage, a plate secured to the shaft and covering the side opening of the transfer passage, an arm mounted to turn with and slide lengthwise upon the shaft, feeding pins carried by said arm and passing through said plate into the transfer passage, means for oscillating said shaft and means for reciprocating said pins lengthwise of the shaft.

18. A can filling machine having a reciprocable tube provided with end cutting edges and means for reciprocating the tube to enter it within and substantially to the bottom of the can to be filled, whereby said tube acts both to separate the required amount of material from a larger mass and to carry it into the can.

19. A can filling device comprising a tube mounted to reciprocate lengthwise, means for placing in an end thereof an amount of material to fill a can, means to enter said tube within and substantially to the bottom of the can which is to be filled, and means for forcing the material out of said tube and into the can as the tube is withdrawn from the can.

Signed at Seattle, Washington, this 29th day of March, 1918.

JAMES C. PORTER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."