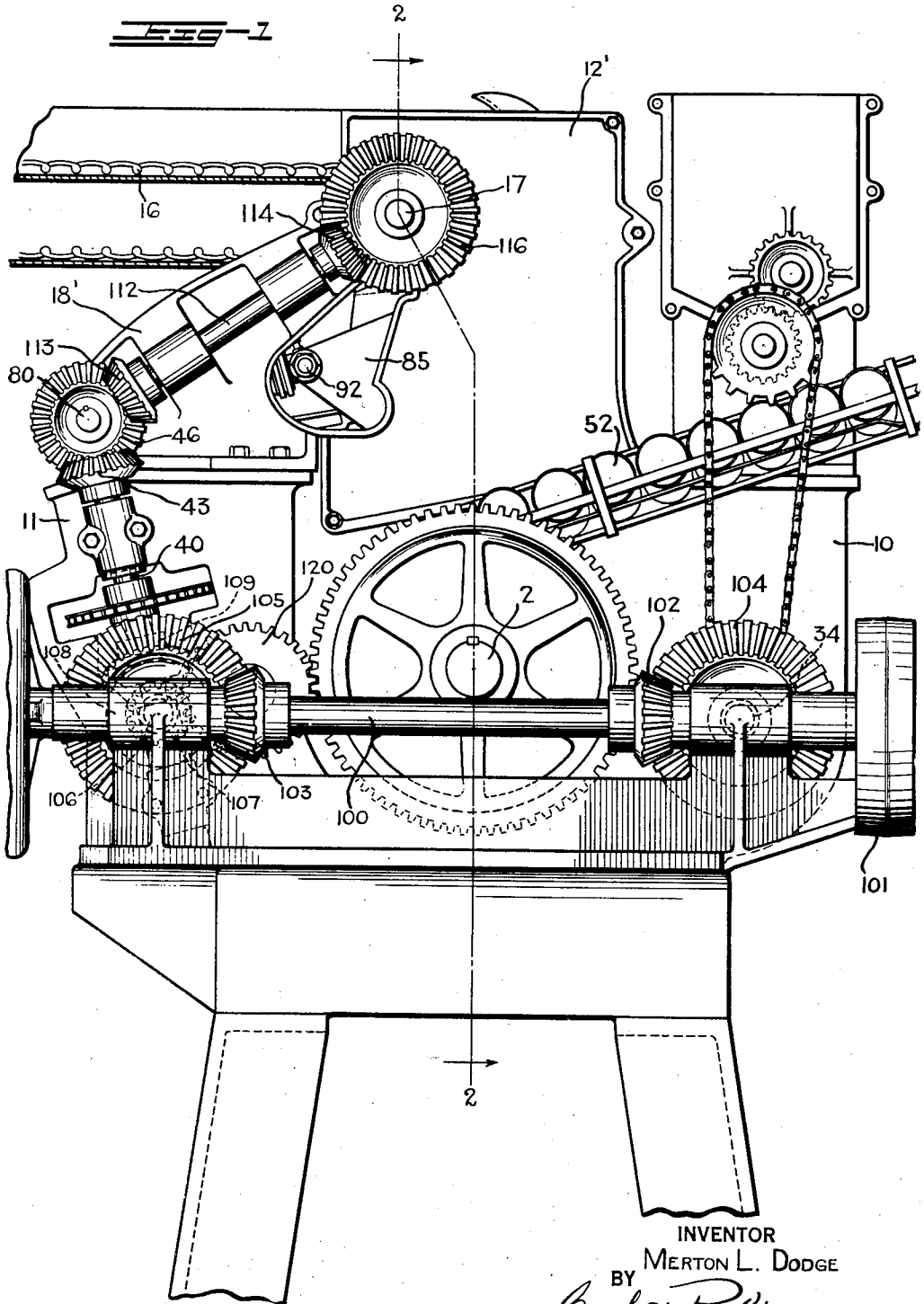
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CAN FILLING MACHINE

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Fig. 1



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CAN FILLING MACHINE

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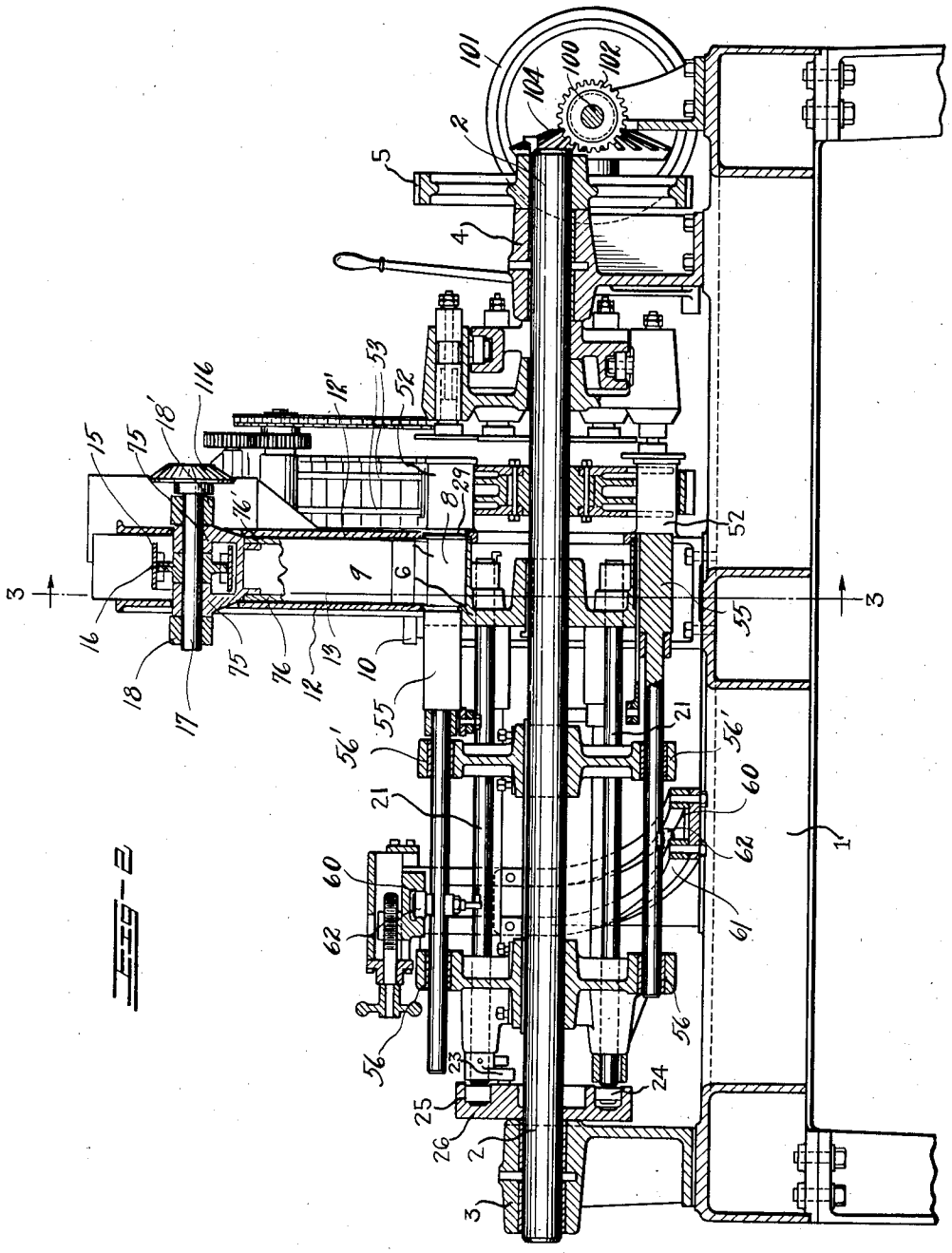


FIG-2

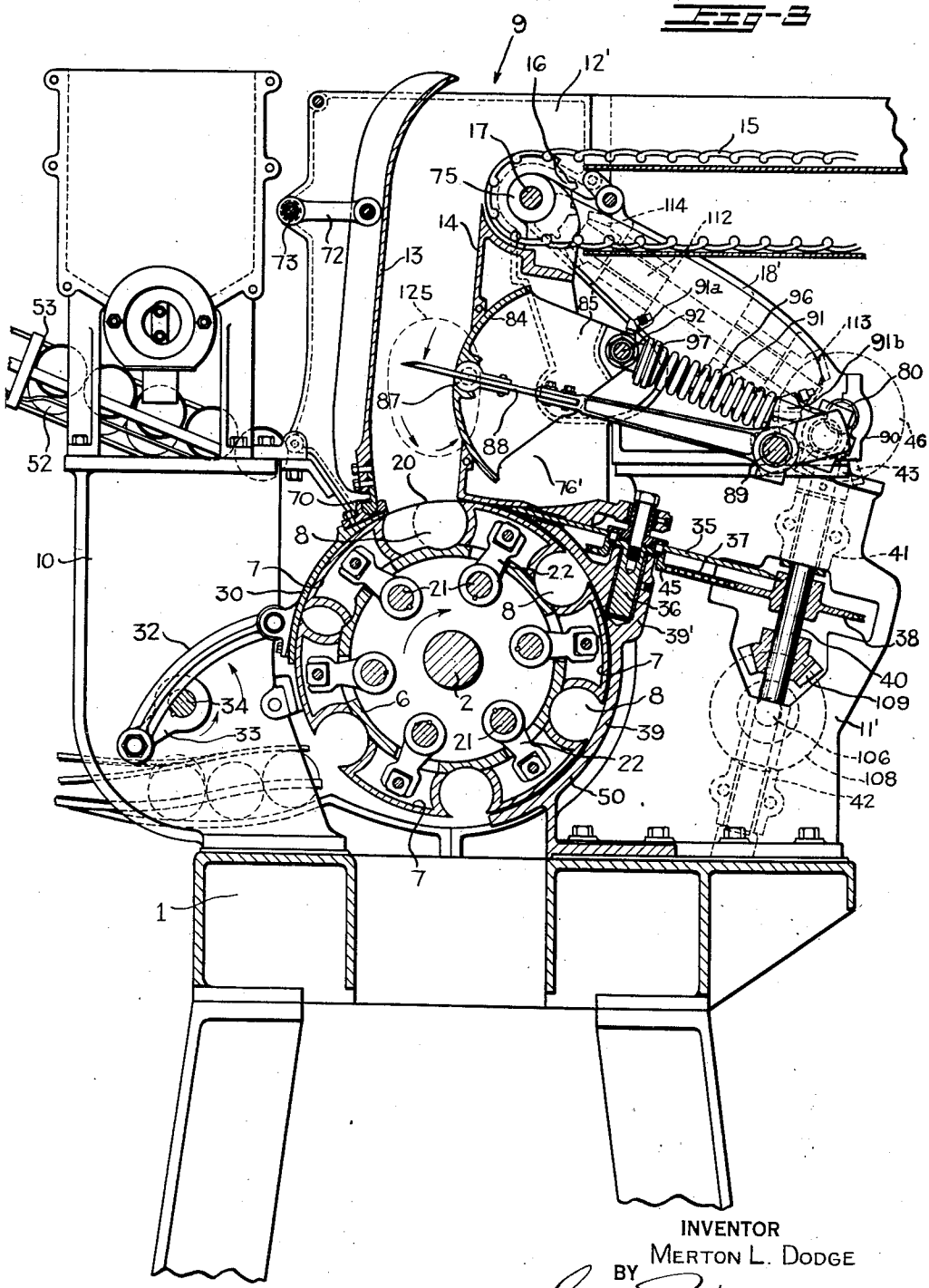
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CAN FILLING MACHINE

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Fig-3



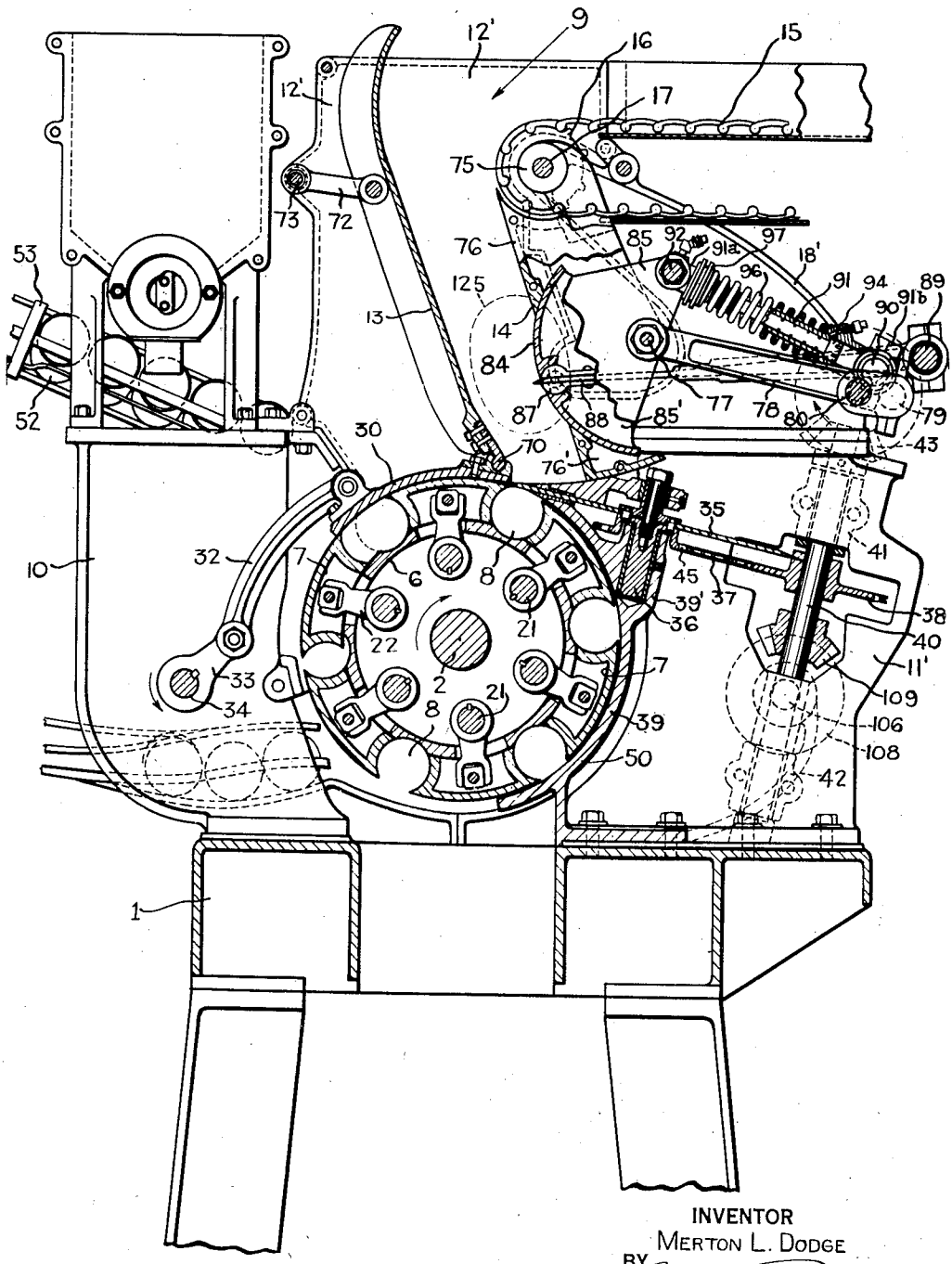
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CAN FILLING MACHINE

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Fig-4



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UNITED STATES PATENT OFFICE

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CAN FILLING MACHINE

Application filed March 28, 1929. Serial No. 350,607.

This invention relates to improvements in can filling machines, and it has particular reference to machines of that kind described and illustrated in the pending application of N. C. Nicholson, filed June 18th, 1928, under Serial Number 286,131; the present invention being in the nature of an improvement in the feed hopper mechanism whereby the material that is to be canned is advanced from the hopper into the molds in the turret where it is pressed and shaped for ejection into the cans.

In the device of the application above referred to, the fish, or other material to be canned, is delivered on a conveyer belt into a hopper and is fed downwardly therein through the hopper outlet and into the molds by the reciprocal action of a packer head. The action of the packer head provided, while satisfactory under favorable conditions, is not always so, especially should there be a variation in the size of the pieces of material delivered into the hopper. If the pieces should be too large they will not feed down properly because of their being thrown back by the upward movement of the packer head, and if they should be too small, they will squeeze back past the downwardly moving head when pressure is exerted by the latter to press the pieces into the mold.

In view of the disadvantages as stated above, that are found in the construction as disclosed in the application above referred to, it has been the principal object of this invention to provide a feed mechanism of an improved character whereby the advancement of the material from the hopper into the molds will be positive and uniform and will remain so regardless of any unevenness in size or shape of the pieces of material being canned.

More specifically, the invention resides in the provision of a feed fork of novel construction and having a novel action, which is slidably supported at its pronged end in a guide bearing that is rotatable in a swinging and oscillating segment of the hopper wall and has operative connection at its other end with a crank shaft which rotates in synchronism with the swinging movement of the wall segment, so that the pronged end of the fork is caused to travel substantially in a circular path, and by this particular action will be caused to project the prongs into the material, then to drag the material downwardly toward the outlet of the hopper. The prongs will then be withdrawn from the material and the position of the segment and the fork changed for projecting the prongs into the hopper at a higher point and again into the material which is continuously being fed into the hopper.

Another object of the invention resides in a certain feature of construction that permits the walls of the hopper to swing in accordance with the reciprocal action of the fork and in accordance with the rotative movement of the turret, so that the outlet of the hopper will be caused to follow along with the molds while the latter are being filled from the hopper.

Other objects of the invention reside in the various details of construction and combination of parts and in their mode of operation, as will hereinafter be described.

In accomplishing these and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Figure 1 is an end view of a can filling machine embodying the present invention.

Figure 2 is a vertical section of the same, taken substantially on the line 2—2 in Figure 1.

Figure 3 is a cross sectional view, taken on the line 3—3 in Figure 2.

Figure 4 is a similar cross sectional view, showing the hopper feeding parts in a position farther advanced than that of Figure 3.

For better understanding, it will be here stated that the machine in which the present invention is embodied is especially designed for canning fish which, preparatory to the canning operation, are cut in chunks or pieces of a size conveniently receivable within the feed hopper. The machine comprises a revolubly driven turret in which a plurality of molds are arranged so that they may be brought, incident to rotation of the turret,

successively past the outlet of the feed hopper and while passing this outlet, each receives therein a charge of fish by virtue of the action of the feed mechanism within the hopper. Cans are delivered successively to the machine and means is provided whereby they are taken up by the turret and are carried therewith in registration with the ends of the molds, while plungers, which are associated with the turret, are reciprocally actuated so as to eject the compressed charges from the molds into the cans. The cans are then delivered from the machine while the turret rotates continuously.

In the present drawings, only those parts of the original machine as shown in the Nicholson application have been shown or described that were thought necessary to a satisfactory understanding of the construction and mode of operation of the present invention.

Referring more in detail to the drawings—

1 designates the bed plate of the machine frame, and 2 is the central supporting shaft of the turret mechanism which comprises the molds within which the charges of fish delivered from the hopper are pressed and shaped for delivery into the cans. This shaft is disposed horizontally and it extends lengthwise of the machine and is revolubly supported at its opposite ends in suitable bearings, as designated at 3 and 4. A driving gear 5 is keyed to the shaft at one end, and through this gear, the turret mechanism is bodily rotated. The turret head 6 is of circular form disposed coaxial of shaft 2 and is provided with an encircling, peripheral guideway within which mold blocks 7 are slidably fitted for movement in the circumferential direction thereof. Each block has its outer surface smoothly and radially curved about the central axis of the turret and all are flush with the peripheral edge of the turret head. The end surfaces, at the adjacent ends of the several blocks, together with the base portion of the guideway within which the blocks are fitted, from molds 8 which are substantially cylindrical in form and which conform substantially in diameter to the diameter of the cans that are to be filled. The molds are open along their outer sides so that they may receive therein the charges of fish from the feed hopper.

The feed hopper, designated in its entirety by numeral 9, is supported directly above the turret from the inner edges of a frame 10 mounted on main frame 1 at one side of the turret and a pair of spaced frames 11—11′ at the other side of the turret, and in its present form of construction, the hopper comprises fixedly mounted opposite side walls 12 and 12′ between which are movably supported the complemental walls 13 and 14; these four walls together forming the hopper into which the fish or other material that is to be canned is delivered on a conveyer belt 15 which operates about a sprocket wheel 16 supported by a shaft 17 that extends transversely through the upper end of the hopper and which is supported at its ends in the upper end portions of a pair of brackets 18—18′ mounted in spaced relation on the upper end of the frames 11—11′. The lower ends of the walls 13 and 14 are spaced apart to provide the discharge opening 20 through which the material is delivered into the molds of the turret as they are brought successively into registration therewith.

During the rotative movement of the turret, the molds are caused, as they approach and come into registration with the hopper outlet, to be opened beyond their normal cylindrical form to receive the charges of material therein, then they are contracted so that the charges received will be compressed into the desired cylindrical form suitable for easy ejection into the cans. The opening and closing action of the molds is effected by shifting the blocks 7 from and toward each other and, for this purpose, I have provided the rocker shafts 21 which extend parallel with the shaft 2 and are rotatably contained in suitable bearings formed in frames constituting a part of the turret body. These shafts are provided at their ends, which terminate within the turret, with lever arms 22 having operative connection with the blocks for shifting the latter and, at their outer ends, with arms 23 carrying rollers 24 which follow within a cam groove 25 in a cam 26 that is fixed about the shaft 2 adjacent the inner face of the supporting bearing 3. This cam groove is so shaped that the passage of the cam rollers therealong incident to rotation of the turret, causes slight rotative action of the shafts at proper times so that the mold blocks will be shifted apart to open the molds for the filling operation, and then to immediately close them to compress the charges to a size and shape suitable for delivery into the cans. This shifting action is so timed that each mold is opened to its full capacity as it comes into registration with the hopper outlet and is closed again by the time it passes from the outlet.

During the filling operation, the molds are closed at their discharge ends by a gate or plate 29, see Figure 2, fixed in the frame and past which the molds rotate.

Slidably mounted upon the outer face of the turret, is a segmental, slide plate 30 adapted to be reciprocally actuated in a circumferential direction in guides provided therefor. This slide is connected pivotally at one end to a link 32 which, in turn, connects pivotally to a crank arm 33 keyed to the end of a drive shaft 34 so that rotation of the latter shaft effects this movement, the action of the slide being illustrated in Figures 3 and 4, which, respectively, show the upper mold to be fully uncovered for receiving a

charge from the hopper and then fully closed and covered by the plate while the charge is compressed. Should there be any surplus or overflow of material projecting from the mold when it is fully closed and when it reaches the position as shown in Figure 4, this overflow will be trimmed off by the sharpened peripheral edge of a revolubly driven disk 35 that is mounted by a stud 36 revoluble in a bearing 39 provided in a supporting bracket 39'. The means provided for revolving the disk consists of a sprocket wheel 45 that is formed integral with or fixed to the upper end of the disk supporting stud 36, and a chain belt 37 which operates about this sprocket wheel and about a sprocket wheel 38 that is alined therewith and which is keyed on a driven shaft 40 revolubly supported in bearings 41 and 42 on the frame 11'. The shaft 40 is revolubly driven by a bevel gear 43 fixed to its upper end and which meshes with a drive gear 46 of mechanism presently described. This trimmer disk 35 lies in a plane that is tangent to the periphery of the turret and its cutting edge slightly underlaps the forward end of the slide plate when the latter is in its farthest advanced position and this provides that any overflow from the covered molds will be smoothly and completely severed.

In order that the compressed charges contained within the molds may not be lost out after the pockets have advanced past the trimming disk, I have provided a retaining wall 50 formed as a part of the bracket 39. This wall is in the form of an arcuate flange which closely overlies the face of the turret along one side, as shown in Figures 3 and 4.

The cans 52 to be filled are delivered by gravity flow through a guide chute 53 to a point adjacent the end face of the turret and are then automatically taken up and held in registration with the ends of the molds during rotation of the turret.

The compressed charges of fish are delivered or pushed from the molds into the cans by reciprocal action of the pistons or plungers 55 which operate for this purpose during the interval that the molds travel from a position immediately past the trimming disk to a position closely approaching a point directly below the shaft 2. The action of the plungers and their actuating means is best shown in Figure 2, which shows the plunger shafts slidably contained in guide bearings 56—56' formed in frame members of the turret. These shafts are alined with the molds in the turret and have plunger heads 55 of piston-like form at their forward ends adapted to be projected inwardly through the molds to push the pressed charges into the cans. For effecting the reciprocal action of the plungers, there is provided a cam slot 60 in a cam 61 which is fixed to the frame 1 and which encircles the turret. Each plunger shaft is equipped with a roller 62 adapted to follow within the cam slot as the turret revolves and this effects the inward and outward action of the plunger at the proper time. The cam is so developed that each plunger starts on its inward travel just as the pocket passes the trimming disk and it advances gradually so as to arrive at its inward limit of travel after the pocket has travelled through about one-half a revolution of the turret.

The machine, as so far described, is substantially the same construction as that of the application first referred to, except insofar as the hopper mechanism is concerned, and since it is in these parts that the present invention resides, their construction, combination and mode of operation will now be described.

As shown in Figures 3 and 4, the plate 13 which forms one of the movable side walls of the hopper 9 is hingedly attached at its lower end as at 70 to the forward end of the slide plate 30 and is pivotally connected at a point near its upper end with one end of a supporting link 72 which, in turn, is pivotally mounted on a pin 73 extended between the side walls 12—12' of the hopper. This construction provides that the wall plate 13 will swing inwardly and outwardly at its lower end in accordance with the reciprocal action of the plate 30.

The hopper wall forming member 14, which is disposed substantially in parallel relation to the plate 13, is hingedly suspended from the cross shaft 17 by means of spaced bearings 75 at its upper end, and it has face plates 76—76' fixed to its opposite edges and to one of these face plates, there is pivotally attached, as at 77, the end of a connecting rod 78 which, at its opposite end, is mounted on a throw 79 of a crank shaft 80 which is revolubly supported in bearings provided in the brackets 18—18'. Rotation of the crank shaft 80 causes oscillating movement of the member 14 and this, through the driving mechanism presently described, is synchronized with the swinging movement of the plate 13 so that they remain substantially parallel at all times.

Mounted between the opposite face plates 76—76' that are secured to the opposite edges of the plate 14, is an arcuate wall segment 84 provided with supporting flanges 85—85' at its opposite ends, which are disposed closely within the face plates 76—76' and are provided with supporting trunnions 86 whereby the segment is pivotally supported by the plates 76—76'. This segment 84 is fitted within an opening formed in the wall 14 by cutting away a portion of the latter toward its lower end and it projects slightly beyond the plane of this wall and, at a point midway between its upper and lower extremity, the

segment is equipped with a rotatably contained bearing 87 through which the pronged end of a feed fork 88 slidably extends into the hopper. The other end of the feed fork is attached to a throw 89 of the crank shaft 80; this latter throw being approximately twice as long as the throw 79 and follows it in its movement at an angular spacing of approximately 30 degrees. The crank shaft 80 is provided also with a third throw 90 on which is mounted one end of a yieldingly adjustable connecting rod 91 which, at its outer end, is pivotally mounted on a pin 92 that is fixed to the side flanges 85 of the segment 84. This latter connecting rod 91 is equipped at one end with a bearing portion 91*a* that is mounted on the pin 92 and at its other end is slidably contained within a bearing portion 91*b* that is mounted on the crank shaft 80. A head 94 is formed on this end of the rod and is slidable in a cylindrical chamber 95 in the bearing portion 91*b*. A coiled spring 96 encircles the rod 91 and bears at its ends outwardly against the bearings 91*a* and 91*b* to urge the connection to its fullest extent, but should pressure beyond a certain degree be brought to bear on the connection, the spring will yield to compensate for this. Pressure of the spring may be varied as necessary by adjustment of a nut 97 that is threaded on the bearing 91*a* and against which one end of the spring rests. The head 94 and cylinder 95 provide an air cushion which prevents jolt or jar incident to rebound.

In the construction of the segmental portion 84 and its supporting flanges 85—85′, the bearings in which the trunnions 86 are contained are located directly within the opening in the plate 14 and the flanges 85—85′ extend rearwardly and upwardly beyond the trunnions so that through their connection with rod 91, a rocking action of the segment is obtained.

For driving the turret and the various other parts of the machine associated therewith, there is provided a main drive shaft 100 suitably supported on frame 1 and equipped with a driving belt wheel 101. On this shaft are bevel gears 102 and 103 which mesh, respectively, with the driving gears 104 and 105 on the ends of the shaft 34 and a shaft 106 disposed parallel with shaft 2 along opposite sides of the machine; the shaft 34 previously being mentioned as the shaft to which connection is made to reciprocate the slide plate 30. Keyed on the shaft 106 is a small pinion gear 107 which through an idler 120 drives gear 5 on shaft 2 and also there is a bevel gear 108 which operates in mesh with a bevel gear 109 on the lower end of the shaft 40; this being the shaft from which the trimming disk 35 is driven. Shaft 40 is equipped at its upper end with the bevel gear 43 which drives the gear 46 keyed on crank shaft 80. The conveyer belt sprocket 16 is driven through connection with gear 46; the connection comprising a shaft 112 supported from the frame 18′ and equipped at its ends with bevel gears 113 and 114 which operate in mesh respectively with bevel gear 46 and a gear 116 keyed on the end of the shaft 17.

It is to be understood that the various gears are so proportioned in size that through the driving connections above described, the various parts are synchronized in their movements so that the crank shaft 80 and the shaft 34 each rotate once for each one-sixth revolution of the turret; this being necessitated by the fact that there are six equally spaced molds or pockets in the turret.

Assuming the parts to be so constructed and operatively assembled, as described, operation of the device would be as follows:

The material to be canned is brought into the hopper on the conveyer belt 15. As the turret revolves, the molds 8 are brought successively into position for receiving charges of material from the hopper and the mold filling operation takes place as each mold travels through an arc of approximately sixty degrees directly across the top of the circular path of travel. As each mold reaches this arc, it is fully expanded by action of shafts 21 and the crank arm 33 on shaft 34 is then in a position at which, through the link 32, the slide plate is retracted to fully uncover the mold. The wall plate 13, accordingly, has been swung to the inclined position of Figure 3 by virtue of its connection with the slide, and the opposite wall member 14, through its connection with the crank shaft 80, is held substantially parallel with the wall 13. The feed fork, at this time, projects through its supporting guide 87 in the segment 84 and extends in an upwardly directed position within the hopper nearly to the plate 13, and the arcuate segment 84, by virtue of the connecting rod 91 and crank shaft, has been swung on its trunnions so as to lift the fork guide to near the upper end of its arc of travel. Then, as the turret continues to rotate, the slide 30 is caused to follow along therewith, keeping approximately even with the adjacent edge of the underlying mold block as the latter crosses toward the next feed block for compression of the charge received in the mold between them. Likewise, the wall plate 14 is swung, because of its connection with the crank shaft, in the direction of travel of the turret so that the outlet 20 of the hopper follows along in registration with the entrance to the mold while the latter is being filled.

During the period of filling the mold, the prongs of the feed fork are caused to swing downwardly in the hopper so as to advance the material beneath them through the outlet of the hopper and into the mold. This action of the feed fork is brought about through the connection of the segment 84 and fork with

the crank shaft. The mold is contracted to its final limit as it reaches the end of the filling arc and any surplus material projecting from its entrance is then trimmed off by contact with the revolving disk. A smooth and clean cut is made possible by bringing the forward edge of the slide 30 up into close contact with the disk edge.

By the time the parts 13 and 14 have swung to their limit of travel in the direction of rotation of the turret, the tines of the feed fork will have swung downwardly to their limits of travel by virtue of the downwardly swinging movement of the segment 84 and upward travel of the outer end of the fork and will also have been withdrawn from the hopper because of the difference in lengths of the cranks, or throws, which control the movements of the fork and the swinging wall 14. Then, as the parts 13 and 14 again swing back toward the position of Figure 3, the hopper passage, for a short interval, is left practically unrestricted and the material delivered by the conveyer falls to the lower end of the hopper. During the latter part of this return movement of the hopper, the segment 84 swings upwardly and the tines of the fork are again projected in an upwardly inclined direction into the hopper passage and through the material therein to prevent any possibility of its backing up. Then, as the parts start again on their forward swing, the fork tines pivot downwardly while the segment 84 also swings downwardly, thereby forcing the material below the fork through the hopper outlet into the mold beneath it. It is readily apparent from the drawings and description, that the travel of the fork tines is substantially the path of a circle and the tines operate to drag the material downwardly within the hopper. The path of travel of the ends of the tines of the fork is indicated by the dash-line circle 125 in Figures 3 and 4. There is no possibility of pressure within the hopper causing the material to squeeze back, and the feed will be positive and continuously downward. It is further apparent that should there be any excessive pressure applied upwardly against the tines, due to an oversupply of material, this will be relieved by compression of the spring 96 associated with the connecting rod 91 and this will permit upward tilting of the segment whereby excessive strain placed on the parts is relieved.

The advantage of the above construction resides in the fact that the hopper passage is unrestricted during the return movement and may be quickly filled with material and that the tines of the fork will be projected into the hopper at the start of the feeding operation and will continue downwardly to prevent any possibility of backing up of the material and to insure its being advanced during each mold filling operation.

Having thus described my invention, what I claim as new therein and desire to secure by Letters Patent, is:

1. In a machine of the character described, a hopper having an outlet of substantially fixed dimensions, a plurality of traveling molds adapted successively to come into fitted relation with the said outlet for filling from the hopper and means for causing the hopper outlet to travel along with each mold through an extended interval for filling.

2. In a can filling machine, a turret provided with a plurality of molds, a hopper having an outlet of substantially fixed dimensions with which the molds successively register for filling and means for causing the outlet to advance with each of the molds through an extended filling arc.

3. In a can filling machine, a rotating turret having a plurality of molds, a hopper having an outlet of substantially fixed dimensions fitted to the turret and across which the molds successively pass for filling, means for causing the outlet to advance in registration with the molds as they successively move through an extended filling arc.

4. In a can filling machine, a rotary, cylindrical turret formed at regular intervals with molds opening to the surface thereof, a hopper having movable walls between which is a discharge opening, normally closed by the turret and across which the pockets successively pass for filling, means for moving the said walls to cause the discharge opening to follow in registration with each of the molds successively as they move through an extended filling arc.

5. In a can filling machine, a rotary cylindrical turret formed with a plurality of molds opening to the surface thereof, a hopper having a discharge opening of substantially fixed dimensions normally closed by the turret and across which the molds successively pass for filling, means for causing the discharge opening to follow in registration with each of the molds in succession as they pass through an extended filling arc, and means for trimming surplus material from the mold at the end of the filling arc.

6. In a can filling machine, a rotary turret formed with a plurality of molds opening to the surface thereof, a hopper having a discharge opening of substantially fixed dimensions across which the molds successively pass for filling, means for causing the outlet to follow in registration with each of the molds in succession as they pass through a definite filling arc, means associated with the hopper for forcing material therein toward the discharge opening during the mold filling periods and means for trimming surplus from the filled molds at the end of the filling arc.

7. In a machine of the character described, a revolving turret having molds therein, means for filling the molds with a food material while said turret is traveling; said means

including a hopper for directing the material into the molds, a feed fork, means for moving the feed fork into the material and in a direction for positively forcing it into the mold and for moving said feed fork with the turret during the period of filling.

8. In a machine of the character described including a rotary turret formed with a plurality of spaced molds, a hopper having a delivery outlet with which the molds successively register for filling, means for causing the outlet to follow along with each mold through an extended filling arc, a feed fork associated with the hopper, means for moving the fork into the hopper and toward the outlet as it advances with the turret during each mold filling period.

9. In a machine of the character described, a rotary turret provided with a plurality of spaced molds, means for filling the molds with a food material while the turret is rotating, including a hopper for directing material into each mold as it passes through a definite filling arc; said hopper having a wall that moves slightly in advance of each mold through the filling period, a feed fork supported in said wall and movable therewith and means for moving the fork for the positive feeding of material from the hopper into the mold then to withdraw it from the material and hopper during the return movement of the wall.

10. In a feed hopper mechanism, a hopper, an oscillatory support, a guide bearing carried by the support, a crank shaft, a feed fork having connection with the crank shaft and slidable in said bearing whereby it is timed and is caused to be moved into and from the hopper by the crank shaft, and a rod connecting the crank shaft and oscillatory support whereby the latter is caused to oscillate in accordance with the reciprocal action of the fork for swinging the fork bodily toward the hopper outlet while projected within the hopper; said connecting rod comprising telescopically joined parts, a spring encircling the rod and acting against the parts to yieldingly retain the rod at full length to obtain full travel of the support, and a nut threaded on the rod and adjustable against the spring to regulate its tension.

11. In a feed hopper mechanism, a hopper, a feed fork, fork supporting means, means for moving the fork reciprocally in said means to cause it to be projected into and to be withdrawn from the hopper, a crank shaft and a rod connecting the crank shaft and fork support whereby the support is moved toward and away form the hopper outlet in synchronism with the reciprocal movement of the fork; said rod comprising telescopically joined parts, one of which acts as a piston, and the other as a cylinder therefor and providing an air cushion to check rebound.

12. In a machine of the character described, including a revolubly driven turret with molds therein, a feed hopper having movable walls, an outlet between the walls with which the molds are successively caused to register, means for moving the walls to cause the outlet to move in registration with each of the molds while the latter are passing through a filling arc and a trimmer across which the mouth of the hopper passes at the end of the filling arc.

13. In a machine of the character described, a revolving turret having mold pockets therein, a hopper, means for oscillating the hopper to cause its outlet to follow in registration with the mold pockets as they successively pass through a filling arc, and a feed fork associated with the hopper and means for causing it to move therein toward the outlet during each filling period, and to be withdrawn during return movement of the hopper.

14. In a machine of the character described, a revolving turret having mold pockets therein, a hopper, means for oscillating the hopper to cause its outlet to follow in registration with the pockets as they successively pass through a filling arc, means in the hopper for feeding material to the outlet during each filling period, a trimmer disk across which the hopper outlet moves at the end of the filling arc, and a shear plate moving with the hopper to cooperate with the disk.

15. In a machine of the character described, including a revolubly driven turret having molds therein, a hopper comprising movable walls providing an outlet between them, means for causing said walls to move in synchronism with the rotation of the turret to cause said outlet to follow in registration with the molds as they successively pass through a filling arc of travel and means for advancing material in the hopper to the molds.

16. In a machine of the character described, a revolubly driven turret having molds therein, a hopper comprising movable walls providing an outlet between their lower ends, crank shafts rotatably driven in synchronism with the turret movement, means connecting said crank shafts with said movable walls whereby they are caused to move together to cause the outlet of the hopper to follow in registration with each of the molds as they pass successively through a filling arc.

17. In a machine of the character described, a revolubly driven turret having molds therein, a hopper comprising swingingly movable, opposite side walls providing an outlet between their lower ends, crank shafts rotatably driven in synchronism with the turret movement, means connecting said crank shafts with said swingingly movable walls whereby they are caused to move to-

gether to cause the outlet of the hopper to follow in registration with each of the molds as they pass successively through a filling arc, a feed fork slidably supported in one wall of the hopper and connected with one of said crank shafts to effect a downward feeding action of the fork within the hopper.

18. In a machine of the character described, a revolving turret including a plurality of circumferentially arranged molds adapted to pass successively through a filling arc, a trimmer adjacent the final end of the filling arc, a hopper comprising a movable wall, a slide plate movable reciprocally on the turret from and across the filling arc and having operative connection with the movable wall to cause the latter to follow along with the molds as they are filled and to cooperate with the trimmer in cutting surplus from the molds at the end of the filling arc.

19. In a machine of the character described, a revolving turret including a plurality of circularly arranged molds, adapted to pass successively through a filling arc, a trimmer adjacent the end of the filling arc, a hopper having swingingly suspended, walls providing an outlet between them through which material is delivered to the molds, a slide plate mounted on the turret for movement from and across the filling arc to cooperate with the trimmer for cutting surplus from the molds at the end of the filling arc and operatively connected with one of the said swinging walls to cause it to closely follow each of the molds across the filling arc, and a revolubly driven crank shaft having operative connection with the other wall to cause it to swing with the opposite wall.

20. In a machine of the character described, a revolving turret including a plurality of molds, a hopper having an outlet adapted to move in registration with said molds; said hopper including a swingingly suspended wall member, a segment pivotally mounted therein, a guide bearing carried by the segment, a triple throw crank shaft, a feed fork connected with one throw of the crank shaft and slidable through said guide bearing for projection into and from the hopper, a rod connecting another throw of the crank shaft with the swingingly suspended wall member to cause the latter to follow along with the molds through a filling arc, and a rod connecting the segment and other throw of the crank shaft to cause the latter to oscillate to swing the guide bearing from and toward the hopper outlet in accordance with reciprocal action of the fork.

Signed at Seattle, Washington, this 16th day of February, 1929.

MERTON L. DODGE.