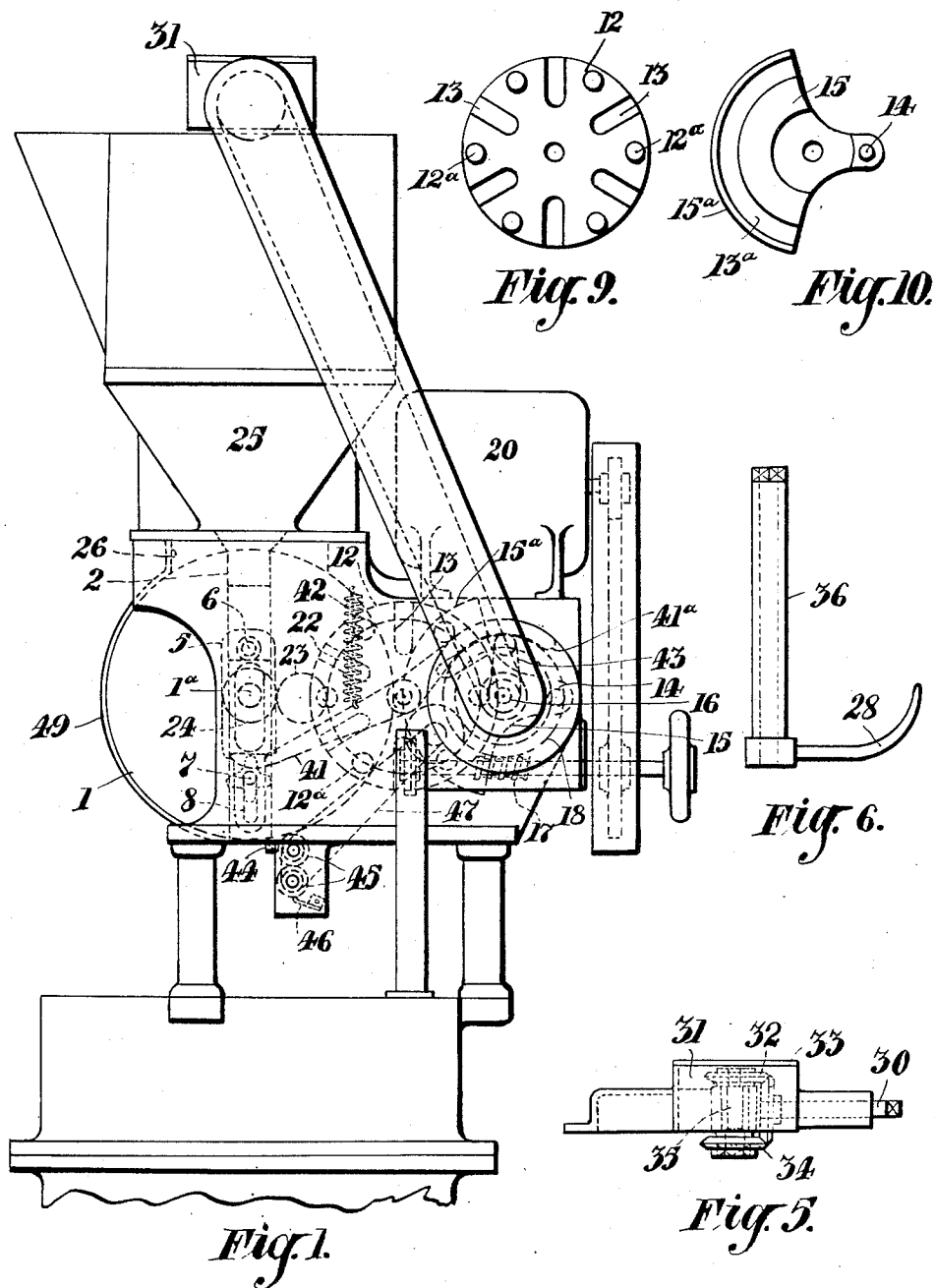


Nov. 6, 1928.

1,690,476

E. CHRISTIANSEN
APPLIANCE FOR DELIVERING GRANULAR MATERIAL
IN MEASURED QUANTITIES BY VOLUME
Filed June 17, 1927

4 Sheets-Sheet 1



E. Christiansen, Inv.
by
C. A. Snow & Co. Atty.

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4 Sheets-Sheet 2

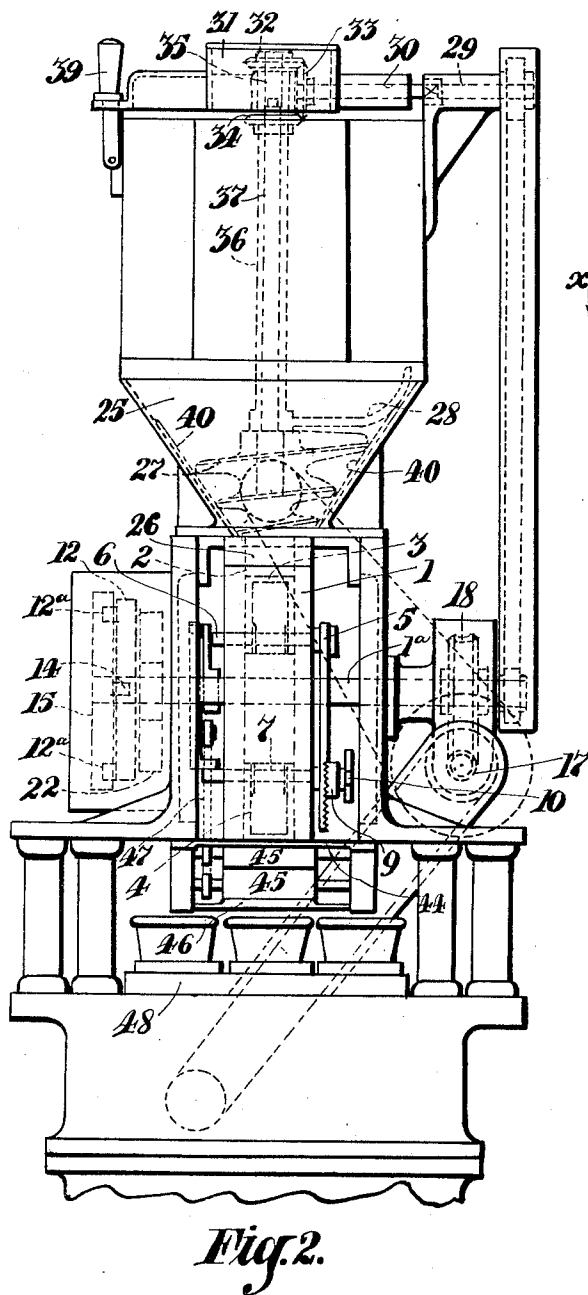


Fig. 2.

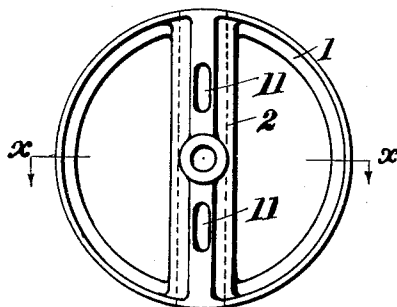


Fig. 7.

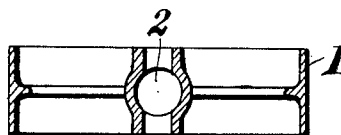


Fig. 8.

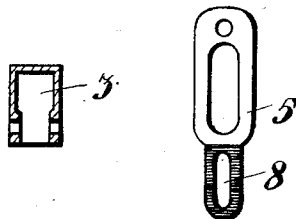


Fig. 4.

Fig. 5.

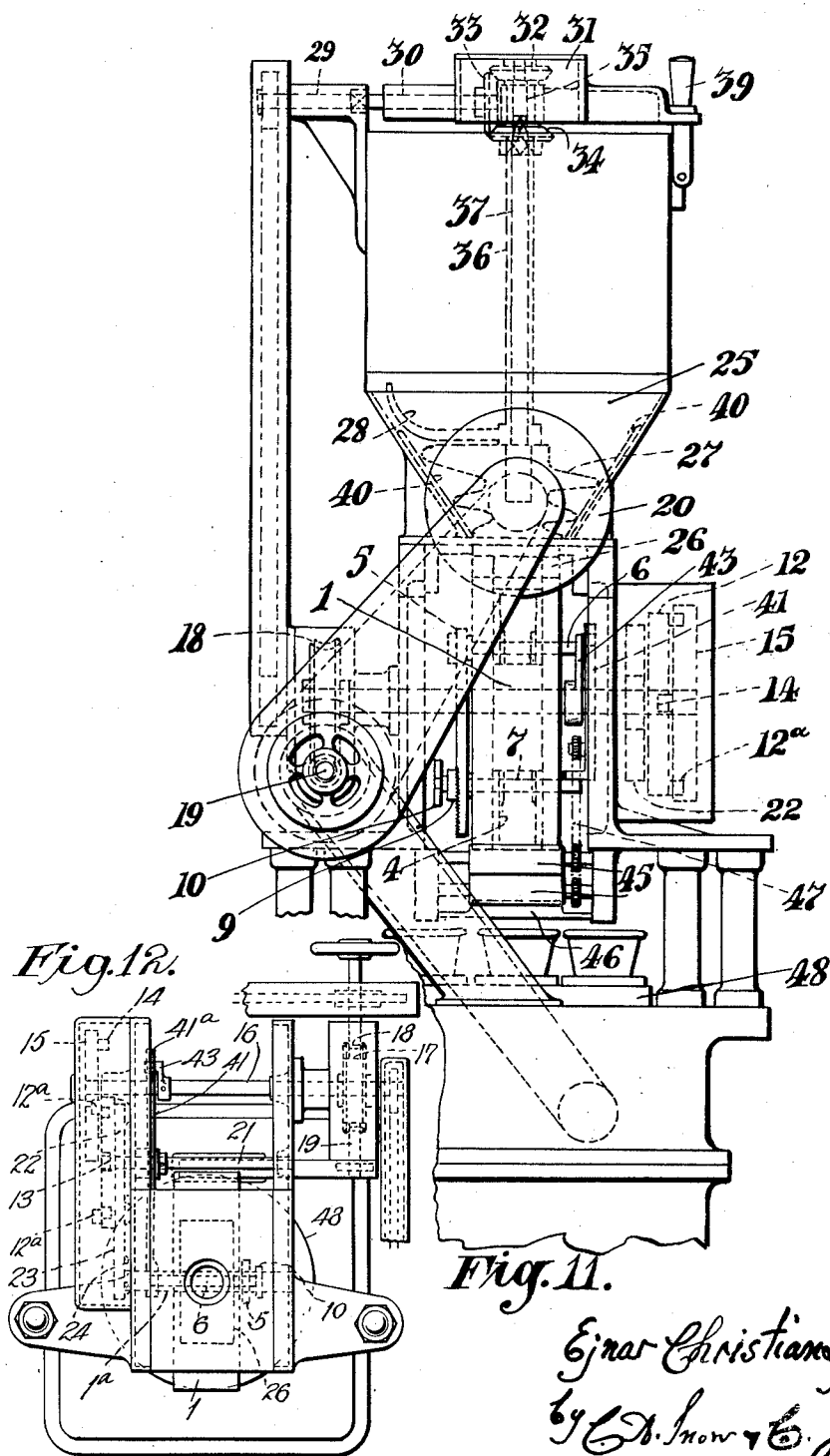
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4 Sheets-Sheet 4

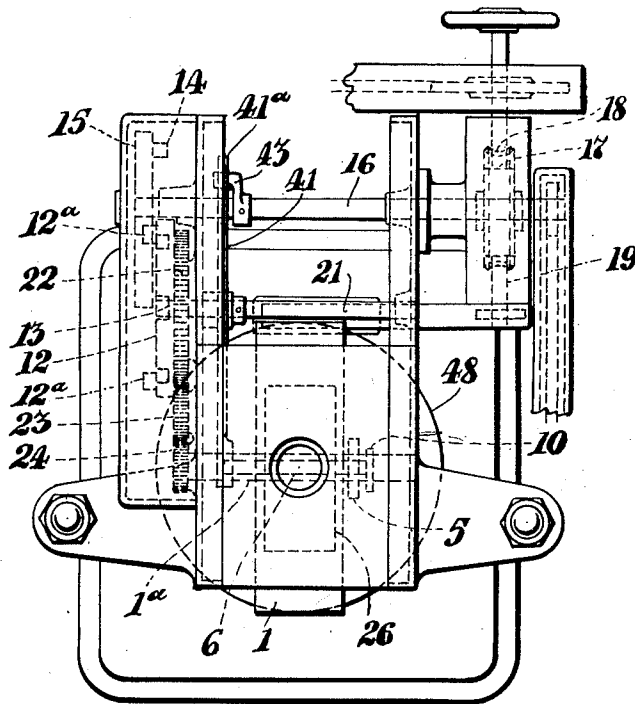


Fig. 12.

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UNITED STATES PATENT OFFICE.

EJNAR CHRISTIANSEN, OF BIRMINGHAM, ENGLAND.

APPLIANCE FOR DELIVERING GRANULAR MATERIAL IN MEASURED QUANTITIES BY VOLUME.

Application filed June 17, 1927, Serial No. 199,557, and in Great Britain June 28, 1926.

This invention comprises improvements in appliances for delivering granular material in measured quantities by volume.

This invention comprises a machine particularly applicable for delivering measured quantities of meat into a pie casing.

According to the present improvements, the machine comprises a rotating drum member which is recessed on diametrically opposite sides and in which two pistons form the bottoms of the recesses, the pistons being connected on the outside of the rotating member by means of an adjustable link which engages pins carried by the pistons, such pins passing through slots in the walls of the recesses. The rotating member is intermittently rotated by means of a disc having radial slots which are engaged by a pin mounted on a rotating member, this arrangement being characterized in that the spindle carrying the rotating member is geared to the said disc so that an increased rotary movement is given to the said rotating member and also characterized in that the said disc is positively held at the end of each forward movement. The pistons are positively moved to eject the material by means of the pins, connected to the pistons, which pass through slots in the side of the rotating member, with which pins means co-act, independently of the adjusting means for the position of the pistons, to eject the meat or the like from the recesses.

The meat is placed in a hopper and is fed into the recesses by means of a screw which is detachably connected to driving mechanism located at the upper end of the hopper. A stirrer is also mounted co-axially with the said feeding screw and is driven in the reverse direction. The meat is directed in a downward direction into pie casings by means of a roller or rollers or other downwardly moving member which is located behind a scraper.

Referring to the drawings:—

Figure 1 is a side elevation of a machine constructed according to this invention.

Figure 2 is a front elevation.

Figure 3 is a face view of the adjustable connecting link for two pistons.

Figure 4 is a section through a piston.

Figure 5 is a view of the detachable driving unit for the conveyer screw and stirrer.

Figure 6 is a view of the stirrer detached.

Figure 7 is a face view of the drum receiving the pistons.

Figure 8 is a section on line *x x* of Figure 7.

Figure 9 is a face view of the radially slotted disc hereinafter referred to, and

Figure 10 is a face view of the rotating member for driving the disc shown by Figure 9.

Figure 11 is a rear elevation of the machine shown by Figures 1 and 2. Figure 12 is a plan view with the hopper and stirrer removed.

Referring to the drawings, the revolving drum 1 has a cylindrical recess 2 formed diametrically through the drum. Two pistons 3 and 4 are connected together and are adapted to reciprocate in the recess 2, the ends of the pistons thus forming the bottoms of recesses in diametrically opposite sides of the drum. The pistons move in unison and when one piston is fully in, the other piston is fully out. The pistons are connected together by means of one link 5, the upper end of which is fixed to the pin 6 passing through the piston 3, whilst the other end is adjustably connected to the pin 7 carried by the piston 4. A slot 8 in the link 5 (Figure 3) receives the pin 7, the end of such pin being carried by a block 9 clamped to the link 5 by means of the nut 10. The block 9 and the face of the link 5 adjacent the slot 8 are conveniently serrated, and a scale may be marked on the edge of the link 5 so that the capacity of the recesses may be readily adjusted. The pins 6 and 7 pass through slots 11 in the wall of the cylindrical recess 2. These slots 11 limit the outward movement of the pistons to the position in which the end of the piston lies flush with the surface of the drum 1.

A feed hopper 25 is located on the top side of the drum 1 so that when one receptacle is moved to register with the mouth of the hopper the piston forming the bottom of such receptacle is at its lowest position in the receptacle to receive the required quantity

of meat. When the drum 1 is rotated through one hundred and eighty degrees this latter full receptacle is placed over a pie casing, and the piston forced outwardly to eject the meat 5 into the pie casing. As the two pistons are connected together the other receptacle which is moved in register with the hopper will be ready to receive the next charge of meat, as the piston in such receptacle will have been 10 moved to its lowest position in the receptacle when the other piston is moved outwardly to eject the meat.

The drum is intermittently rotated by way of the shaft 16 through one hundred and 15 eighty degrees so that time is allowed when the drum is stationary for the meat to be fed into the top receptacle. The device for effecting this comprises a disc 12 having radial slots 13 which are engaged by a pin or 20 roller 14 mounted on the rotating member 15. Pins or rollers 12^a are mounted on the disc 12 between the slots 13 for engagement with the groove 13^a in the tail piece 15^a, to hold the disc 12 and consequently the drum 1 stationary 25 during the filling of and discharging from the receptacles. The shaft 16 is rotated by means of a worm 17 and worm wheel 18 from the spindle 19, the latter spindle being driven by a chain drive from the electric motor 20. The shaft 21 carrying the disc 12 30 carries a gear wheel 22 which drives the drum 1 through the medium of the gear wheels 23 and 24. It will thus be seen that the drum is quickly rotated through one hundred and 35 eighty degrees during a portion of one complete revolution of the member 15, the remainder of a revolution of such member 15 taking place whilst the drum is stationary. The hopper 25 is mounted over the drum and 40 a member 26 is located between the bottom of the hopper and the periphery of the drum which is a sliding fit over the curved face of the member 26. The lower portion of the hopper 25 is conveniently conical and a correspondingly shaped feeding screw 27 is 45 mounted thereon, the feeding screw being supported by resting on the conical wall of the hopper. The feeding screw is suitably driven and preferably the arrangement is 50 such that the feeding screw may be readily removed for cleaning purposes. A stirrer 28 is also preferably provided for ensuring that the meat or the like will pass down on to the feeding screw. In the arrangement shown, 55 the spindle 29 is driven by chain gearing from the shaft 16, and such spindle 29 is detachably engaged with the end of the spindle 30 carried by the casting 31. This casting 31 also carries the bevel wheels 32, 33, and 34 60 so that such casting and the bevel wheels may be removed as a complete unit. The spindle 37 of the feeding screw has a square end for engaging the spindle 35 of the bevel wheel 32. The stirrer 28 is carried by the sleeve 65 36 which is slidably engaged over the spin-

dle 37, and the end of such sleeve has a square end for engaging in a square recess in the boss of the bevel wheel 34. The casting 31 is fixed at one end by means of a pivoted lever 39 or in any other convenient manner. 70 When the lever 39 is released, therefore, the casting 31 can be lifted away so that the shaft 30 is slidden out of engagement with the shaft 29 and with the bevel wheels out of engagement with the sleeve 36 and spindle 37. 75 The stirrer and feeding screw can then be lifted from the feed hopper which greatly facilitates cleaning operations. The feed spindle is therefore continuously driven and in order therefore to allow for escape of meat 80 when a receptacle is not under the feed hopper, ribs 40 are provided on the sides of the hopper to thereby form channels by which meat can escape upwardly. The pistons 85 would normally be forced downwardly by the meat fed into the top receptacle and by the weight of the pistons, but preferably positive means are provided for moving the pistons downwardly, such means conveniently comprising a lever 41 which is normally 90 pulled upwardly by means of a spring 42 to bear against the drum shaft 1^a. This lever is depressed by means of an arm 43 mounted on the shaft 16 a pin on which engages the tail piece 41^a of the lever 41. The lever is 95 timed to be depressed after the drum has been rotated into the position shown by Figure 1 with the lower receptacle in position for discharging the contents. The lower end of the lever 41 bears on the end of the pin 7 projecting 100 from the side of the drum 1 (opposite to the side of the drum on which the link 5 lies) for discharging the lower receptacle. Any other suitable means may however be used for this purpose. 105

To prevent meat clinging to the drum a scraper 44 is fixed to the machine and adapted to bear on the drum in the position shown by Figure 1 to thereby prevent any meat or the like being carried round by the drum. 110 The meat will have a tendency to be carried rearwardly and a roller or rollers 45 is or are provided for causing the meat to slide downwardly and also to prevent any lodgment or collection of meat, the rollers being 115 rotated downwardly in the same direction by means of a chain 47. A scraper 46 is also spring pressed against the roller or bottom roller 45 to keep such roller clean. The outer edges of the recess 2 form a cutter for shearing 120 off the meat when the receptacle has been filled from the hopper.

The table 48 is rotatably mounted on the bed of the machine to be intermittently rotated so that pie casings are successively 125 placed in position for being filled. A guard 49 may be fitted to prevent material being thrown from the recesses when the drum is rotated.

I claim:

1. A machine for delivering granular material in measured quantities by volume, comprising a rotating member having recesses in diametrically opposite sides, pistons forming the bottoms of the recesses, and a link which is located on the outside of the rotatable member and which adjustably connects opposite pistons to vary the capacity of the recesses.
2. A machine for delivering granular material in measured quantities by volume, comprising a rotating member having diametrically opposite recesses, pistons forming the bottom of such recesses, a link connecting the diametrically opposite pistons on the outside of the rotating member, pins on the pistons passing through slots in the walls of the recesses, one of which is adjustably connected to the end of the link, and an index member indicating the position of adjustment.
3. A machine for delivering granular material in measured quantities by volume, comprising a rotating member having diametrically opposite recesses, pistons forming the bottom of such recesses, a link connecting opposite pistons, means for intermittently turning the rotating member so that one recess is successively brought to lie under a feed hopper whilst the opposite recess is in the discharging position, pins carried by the pistons and projecting through slots in the walls of the recesses, and means co-acting with the pins for positively moving the pistons so that the piston is in its innermost position in the recess opposite the feed hopper and in its outermost position in the opposite recess in the discharging position.
4. A machine for delivering granular material in measured quantities by volume, comprising a rotary drum, having diametrically opposite recesses, pistons forming the bottom of the recesses, a link connecting the pistons, so that when one is in the innermost position the other is in the outermost position, a feed hopper having an outlet opening at the top of the drum, and means for intermittently rotating the drum comprising a member which is intermittently rotated through an angle less than one hundred and eighty degrees and which is geared to the drum so that such drum is driven intermittently through one hundred and eighty degrees.
5. A machine for delivering granular material in measured quantities by volume, comprising a rotating member having diametrically opposite recesses, pistons forming the bottom of such recesses, a link connecting opposite pistons, means for intermittently turning the rotary member so that one recess lies under a feed hopper whilst the opposite recess is in the discharging position, pins carried by the pistons and projecting through slots in the walls of the recesses, and means co-acting with the pins for positively moving the pistons so that the piston is in its innermost position in the recess opposite the feed hopper and in its outermost position in the opposite recess in the discharging position, comprising a lever pivoted intermediate its ends with one end in position for bearing on the said pins whilst the other end bears on a cam of the driving member.
6. A machine for delivering granular material in measured quantities by volume, comprising a rotating member having diametrically opposite recesses, pistons forming the bottom of such recesses, a link connecting opposite pistons, means for intermittently turning the rotary member so that one recess lies under a feed hopper whilst the opposite recess is in the discharging position, a feed screw mounted in the feed hopper, and a stirrer mounted co-axially with the said feed screw and adapted to rotate in the opposite direction.
7. A machine for delivering granular material in measured quantities by volume, comprising a rotating member having diametrically opposite recesses, pistons forming the bottom of such recesses, a link connecting opposite pistons, means for intermittently turning the rotary member so that one recess lies under a feed hopper whilst the opposite recess is in the discharging position, a feed screw mounted in the feed hopper, a stirrer mounted co-axially with the said feed screw and adapted to rotate in the opposite direction, and means for driving the feed screw and stirrer located at the upper end of the hopper and detachably connected to the feed screw and stirrer.
8. A machine for delivering granular material in measured quantities by volume, comprising a rotating member having diametrically opposite recesses, pistons forming the bottom of such recesses, means for intermittently turning the rotary member so that one recess lies under a feed hopper whilst the opposite recess is in the discharging position, and means for directing the ejected meat into a pie casing comprising a scraper fitted adjacent the periphery of the drum and a downwardly moving member against which the meat moves after leaving the scraper.
9. A machine for delivering granular material in measured quantities by volume, comprising a rotating member having diametrically opposite recesses, pistons forming the bottom of such recesses, means for intermittently turning the rotary member so that one recess lies under a feed hopper whilst the opposite recess is in the discharging position, and means for directing the ejected meat into a pie casing comprising a scraper fitted adjacent the periphery of the drum, and a pair of rollers driven to rotate to direct the meat downwardly.
10. A machine for delivering granular material in measured quantities by volume, com-

prising a rotating member having diametrically opposite recesses, pistons forming the bottom of such recesses, a link connecting opposite pistons, means for intermittently turning the rotary member so that one recess lies under a feed hopper whilst the opposite recess is in the discharging position, and means for directing the ejected meat into a pie casing comprising a scraper fitted adjacent the periphery of the drum and a pair of rollers driven to rotate to direct the meat downwardly, and a scraper on the bottom roller.

11. A machine for delivering granular material in measured quantities by volume, com-

prising a rotating drum having recesses in diametrically opposed sides, pistons forming the bottom of the recesses, and connected together to move in unison, means for intermittently rotating the drum with one recess opposite a feed hopper, and the opposite recess in the delivery position, and mechanical means for positively moving the connected pistons which come into operation when the drum is stationary.

In witness whereof I have signed this specification.

EJNAR CHRISTIANSEN.