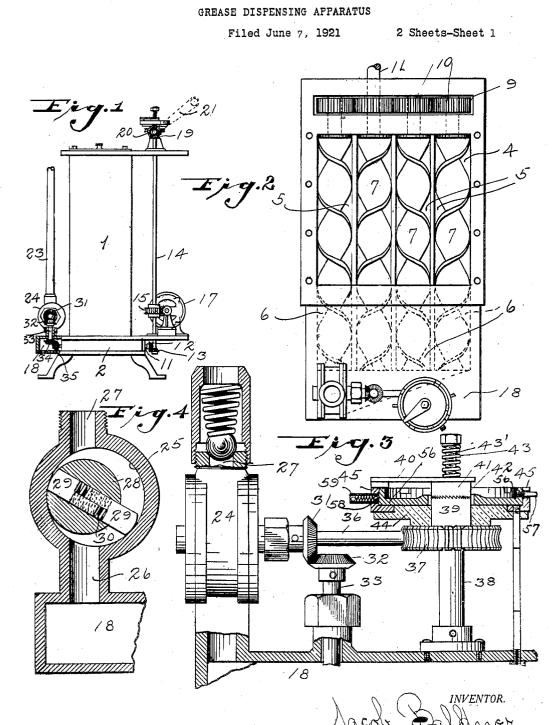
Jan. 19, 1926.

1,570,032

ATTORNEY

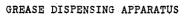
J. BALDNER



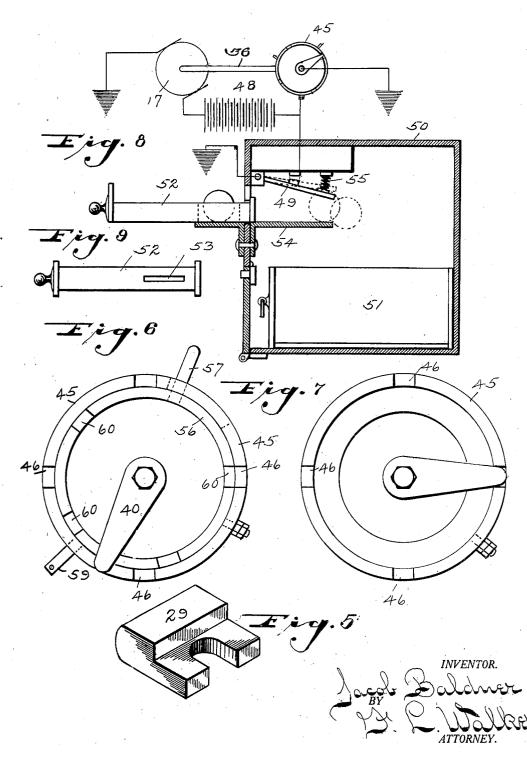
Jan. 19, 1926.

J. BALDNER

1,570,032



Filed June 7, 1921 2 Sheets-Sheet 2



1,570,032

Patented Jan. 19, 1926. UNITED STATES PATENT OFFICE.

JACOB BALDNER, OF XENIA, OHIO.

GREASE-DISPENSING APPARATUS.

Application filed June 7, 1921. Serial No. 475,637.

Tc all whom it may concern: Be it known that I, JACOB BALDNER, a citizen of the United States, residing at Xenia, in the county of Greene and State 5 of Ohio, have invented certain new and use-

ful Improvements in Grease-Dispensing Apparatus, of which the following is a specification.

My invention relates to dispensing appa-

- 10 ratus for plastic and semi-fluid materials, and more particularly to measuring means therefor by which the discharge is regulated in measured quantity.
- The present application is a continuation 15 in part of my pending application for Letters Patent Serial No. 453,978, filed March 21, 1921.

The object of the invention is to simplify the structure as well as the means and mode

- 20 of operation of such apparatus, whereby it will not only be cheapened in construction, but will be more efficient in use, positive in operation, uniform in action, accurate and unlikely to get out of repair. A further object of the invention is to
- 25 provide a dispensing apparatus with a governor or control device which will insure the uniform and continuous discharge of the material in measured quantities.
- 30 apparatus, by which the discharge mechanism will be automatically arrested when a predetermined quantity of the material 25 has been ejected.

A further object of the invention is to provide means for readily adjusting the apparatus to discharge the material in greater or less measured quantity, and to further 40 provide for automatic coin control or finger control for setting the mechanism in operation.

A further object of the invention is to provide in conjunction with the dispensing apparatus, a "boas er" or auxiliary ejector or pump to insure uniform and continuous discharge.

With the above primary and other incidental objects in view as will more fully appear in the specification, the invention consists of the features of construction, the parts and combinations thereof and the mode of operation or their equivalents as hereinafter described and set forth in the 55 claims.

shown the preferred, but obviously not necessarily the only embodiment of the invention, Fig. 1 is a side elevation of an assembled dispensing apparatus wherein is 60 embodied the present invention. Fig. 2 is a top plan view of the apparatus with the tank or container and driving motor re-moved. Fig. 3 is a side elevation, partly in section of the auxiliary ejecting and meas- 65 uring mechanism and the indicator or controller therefor. Fig. 4 is a vertical sectional view of the auxiliary ejector or measuring device. Fig. 5 is a detail perspective view of one of the blades or vanes of the 70 rotary ejector. Fig. 6 is a top plan view of the adjustable controller, governing the discharge of multiple units of measurements of the material. Fig. 7 is a top plan view of the governor or controller with the mul- 75 tiple feature removed, necessitating a separate manual closing of the electric circuit to the motor, either by the deposit of a coin or the closing of a switch for each measured unit of material discharged. Fig. 8 is 80 a detail sectional view of a coin controlled switch, and a diagrammatic view of the electric circuit controlling the automatic motor operation of the apparatus. Fig. 9 85 is a detail of the coin slide bar.

A further object of the invention is to Like parts are indicated by similar provide automatic control means for the characters of reference thruout the several views.

Referring to the drawings, 1 is the container or reservoir for the material to be ⁹⁰ discharged in measured quantity, which container rests upon a base 2, within which is contained the dispensing or ejecting apparatus. This base or housing 2 is provided with an inlet opening or pocket 4 95 with which the open bottom of the container 1 registers. The bottom of the housing 2 comprises a plurality of parallel semicircular grooves or recesses 5, which communi-100 cates with concentric bores or circular passages 6 in the base or housing 2, and extending beyond the receiving opening 4. Lo-cated in each of the semi-circular grooves 5 and extending thence into the correspond-105 ing bore or passage, is a revoluble spiral conveyor 7. There may be any number of these spiral conveyors in the series. In the drawing, but four have been shown. It is obvious, however, that more or less may be employed. These conveyors 7 extend suf-110 ficient distance thru the passages or bores Referring to the drawings, wherein is 6 to afford ample bearing therein for the

conveyor screws, while at the opposite end reciprocate to and fro therethru, mainthese conveyor screws 7 are provided with trunnions or drive shafts, having bearings in the terminal wall of the receiving recess 5 4, thru which they extend into the adjacent pocket or chamber 9, where they carry inter-

meshing gear pinions 10.

As shown in the drawings, the succeeding conveyors are reversed and are rotated 10 in reverse direction by the intermeshing gear pinions 10, thereby serving to simultaneously advance the plastic or semi-fluid material uniformly in the same direction.

The trunnion shaft of one of the con-15 veyor screws is extended beyond the housing of base 2 as indicated at 11, to afford a drive connection for the series of conveyor screws 7. The conveyor screws 7 may be manually operated by means of a hand 20 crank, or may be motor driven, the latter being the preferred mode of operation. In Fig. 1 of the drawing, the shaft extension 11 is shown provided with a beveled gear pinion 12, with which meshes a second 25pinion 13 upon a vertically disposed drive shaft 14. Carried by the shaft 14 is a worm wheel 15, with which meshes a worm upon the armature shaft of a driving motor 17. It will be obvious that upon operation of ³⁰ the driving motor the spiral conveyors 7 will be simultaneously actuated to discharge grease or other plastic or semi-fluid material from the container 1, thru the lateral bores 6 into the pressure chamber 18, formed at one end of the base or housing 2. The bores or passages 6 all communicate with this pressure chamber and simultaneously discharge thereinto.

At its upper end the drive shaft 14 carries 40 a bevel gear 19, meshing with a similar gear upon a transverse shaft 20 to which may be connected a hand crank 21, for hand operation of the apparatus. In the event that either the hand crank or motor are 45 to be utilized as actuating means, the worm wheel 15 will be connected to the shaft by a pawl and ratchet connection. The mechanism thus far described is substantially that disclosed and claimed in my co-pending ap-50 plication aforementioned.

Leading from the pressure chamber 18 of the base or housing 2 is a discharge conduit 23.Located in this discharge conduit 23 is a rotary power driven meter 24, com-prising the cylindrical housing 25, having 55 inlet and outlet passages 26 and 27 respec-tively. Mounted eccentrically within the circular housing 25 is a rotor 28 having therein two oppositely disposed overlapping sliding blades or vanes 29. These vanes are bifurcated on their inner edges to receive a spring 30 by which the blades or vanes are forced apart and against the wall of the housing 25 as the rotor 28 revolves. During ing with the worm gear 37. This worm the rotation of the rotor the blades or vanes

60

taining at all times their bearing contact upon the interior walls of the cylinder under the influence of the spring 30. The grease or other plastic or semi-fluid material enters 70 the cylinder 25 from the pressure chamber 18, thru the inlet passage 26, filling the space immediately back of the vane or blade 29 until the succeeding blade or vane passes the inlet port whereupon the charge of ma- 75 terial is forcibly advanced by the movement of the blade or vane. The capacity of the spiral conveyors 7 is greater than that of the rotary meter so that the material is always maintained in the pressure chamber 80 18 and supplied thence to the rotary meter under a relatively high pressure. The excess material advanced by the spiral conveyors 7 merely leaks back or when the passages or bores 6 are filled to the maximum 85 pressure, no more material can be forced thereinto by the spiral conveyors, since the material will merely push upwardly within the container 1. The capacity of the spiral conveyors being so much greater than that 90 of the rotary meter, insures at all times an ample supply of material under pressure at the inlet port of the rotary meter. This supply under pressure in turn insures the intake chamber of the meter being fully 9.5 and completely filled at a uniform pressure at each rotation of the rotor 28. This intake chamber being of a definite capacity receives a predetermined charge at each half rotation of the rotor 28, and serves as a unit 100 of measurement. The rotary meter is so designed that a predetermined number of rotations or predetermined number of charges shall equal exactly one pound or if units of liquid measure are desired, it is 105 designed that a predetermined number of such charges shall equal one pint or one quart of the material. Upon the rotation of the blades or vanes, the charge of material received upon the cylinder 25 is dis-110 charged upwardly thru the outlet passage 27 and the discharge conduit 23. The rotor 28 is positively driven by means of a bevel gear 31 upon the shaft of the rotor, meshing with a similar gear 32 upon a vertically ¹¹⁵ disposed stem or shaft 33, mounted in a suitable bearing in the top wall of the pres-sure chamber 18. At its lower end, the vertical shaft 33 carries a gear pinion 34 meshing with a similar pinion 35 upon a 120 stem or stub shaft carried by one of the spiral conveyors 7. Thus the rotary meter is positively driven in unison with the actuation of the spiral conveyors 7.

In order to indicate the quantity of ma-¹²⁵ terial discharged, the shaft 36 of the rotor 28 is extended laterally as shown in Fig. 3, and carries a worm (not shown) meshgear 37 is suitably mounted upon a stand- 130

upon the top of the pressure chamber 8. that the traveling arm 40 rotates in unison The hub 39 of the worm gear carries the rotating arm 40, which plays over a circi-5 lar disc, which may be graduated in units of measurement as pounds, or pints and quarts as desired and in accordance with

- the capacity of the rotary meter. Thus by watching the travel of the arm 40, the op-10 erator may know how much material has been discharged. For convenience in resetting the arm 40, to a predetermined starting point, this arm is provided with a hub 41, having a series of inclined ratchet
- 15 teeth or clutch teeth 42 engaging with corresponding teeth on the upper end of the worm gear hub 39. The clutch teeth of the hubs 39 and 41 are maintained in opera-
- tive engagement one with the other, by 20 means of a spring 43, surrounding an ex-tension or stem 43' carried by the trunnion stud or shaft upon which the members rotate.
- In lieu of using the traveling arm 40 and 25 the head or disc over which it travels, merely as an indicator, these devices may be utilized as an automatic governor or controller, by which the apparatus is arrested when a predetermined quantity of material has been discharged. To this end 30
- the device is utilized as a traveling switch or commutator in the motor circuit, the current being conducted thru the traveling arm and the contact ring over which it
- engagement of which by the traveling arm the circuit is broken. When so utilized as a governor or controller, this mechanism
- comprises a base plate or head 44 of insulat-40 ing material, on which is mounted the contact ring 45. The traveling arm 40 bears upon and has wiping contact with the contact ring 45, thruout its full circle of travel.
- Located at spaced intervals in the con-45 tact ring are inserts 46 of fibre or other These inserts are insulating material. spaced apart a distance corresponding to the travel of the arm 40, during the dis-
- charge of one unit of measurement of the 50 material, whether the same be a pound or a pint, or other quantity. That is to say, by starting the motor, when the contact arm 40 is upon one of these insulating in-
- serts, the apparatus is designed to discharge 55 one unit of material either a pound, a pint or some greater quantity, while the arm 40 is traveling to the next succeeding insert. In the drawings, but four inserts have been shown located in position ninety degrees from each other. This may be varied, how-60

ever, according to the capacity of the meter.

ard or post 38, in this instance mounted or governor by means of the shaft 36, so with the operation of the motor. One side of the motor is shown as being grounded, the ground being upon the frame of the 70 apparatus. In this diagram the traveling arm 40 is also shown as grounded upon the frame of the apparatus, while the oppo-site side of the motor and the contact rings 45 are interconnected thru battery 48, or 75 other suitable source of electric energy. There is also shown in the diagram, a switch 49, one side of which is likewise grounded upon the frame of the apparatus, the other side of which is connected with 80 the battery 48. Assuming that the traveling arm 40 is at rest upon one of the insulating inserts 46, where it will come to rest at the end of each succeeding operation, the momentary closing of the switch 49 will close 85 a circuit from ground upon the frame, thru battery 48 thence thru the motor 17, to the opposite side of the motor, which is likewise grounded upon the frame completing the motor circuit. This sets the motor in 96 operation and drives the traveling arm 40 causing it to move off of the insert into contact with the ring 45, whereupon after the release of the switch 49, current will be supplied from the battery to the contact 95 ring 45, thence thru the arm 40 engaged therewith to ground upon the frame and thence to the opposite side of the motor, which is likewise grounded and thru the ³⁵ travels, in which is inserted at spaced in- motor back to the battery. The current will ¹⁰⁰ tervals, inserts of insulating material upon continue to flow to this course, actuating the motor to drive the dispensing and measuring apparatus, and simultaneously actuat-ing the traveling arm 40 until said arm reaches the next succeeding insulating in- 105 sert 46, whereupon the circuit will be broken and the motor arrested. The switch 49 may be manually operated and may comprise merely a push button or similar device for starting the motor. In lieu of ¹¹⁰ manually operating the switch 49 to start the motor, there is shown in Fig. 8 coin controlled means by which the switch is closed upon the insertion of a coin of proper 115 size for instance, a twenty-five cent piece. The construction shown in Fig. 8 is extremely simple, and is for illustrative purposes only. It comprises a housing 50 which may be located at any convenient point either on the apparatus or at some distant point. 120 In the bottom of the housing 50 is a money drawer or till 51, while in the side of the housing is mounted a reciprocatory slide bar 52, having therein a slot 53 to receive 125the coin. This slide bar rests upon a ledge or shelf 54, which forms a bottom for the slot 53, until the bar reaches its innermost A typical control circuit is shown in Fig. position of adjustment, whereupon the coin 8, wherein the actuating motor 17 is shown is permitted to fall thru the slot beyond the directly connected with the control device end of the ledge or shelf into the receiving

130

box or till 51. However, in its inward movement upon the reciprocation of the bar 52, the coin engages the switch arm 49 and elevates such arm against the tension of the 5 spring 55, to close the motor circuit and start the apparatus in operation.

As thus far described, it is necessary to close the circuit for each measured unit, of material whether the same be a pound 10 or a pint. That is to say, when the apparatus is started it will continue to operate until the traveling arm 40 engages the succeeding insulating insert 46 whereupon the

mechanism will be arrested. In Fig. 6 there 15 is shown additional means whereby the arm may be caused to travel different distances according to the number of measured units of material to be discharged. That is to say, adjustment is provided whereby the

20 arm may be made to continuously advance during the discharge of one, two, three or more units. To this end there is mounted inside the contract ring 45 a second ring or disc 56, freely rotatable within the ring 45,

- 25 by means of a short handle or stem 57, projecting laterally therefrom thru a suitable spot in the primary contact ring 45. spring detent comprising a spring clasp ball
- 58, contained in a tubular housing 59 is en-30 gageable in any one of a series of depressions or socket in the periphery of the inner or adjustable contact ring 56 to maintain the ring in different positions of adjustment. This inner or secondary contact ring extends
- 35 flush with the contact surface of the primary ring 45, and is engaged simultaneous with the ring 45 by the traveling arm 40. The adjustable or secondary contact ring has therein either open notches 60 or insu-
- 40 lating inserts in such notches. These notches or insulating inserts 60 are differently spaced from those of the primary contact ring 45, and are so situated that upon the oscillatory movement of the inner or secondary contact
- 45 ring, these notches or insulating inserts 60 are moved into and out of registry with the insert 46 of the primary ring. Thus the secondary or inner ring serves to bridge the
- insulating insert of the primary ring and 50 serves to conduct the current while the traveling arm passes over the insert 46. The traveling arm 40 will continue to rotate until it encounters two insulating spaces 46 and 60 in registry one with the other, where-upon the circuit will be broken. Thus if 55 only one unit of the commodity is to be discharged, the inner or secondary ring is adjusted to bring one of the insulating spaces
- 60 into registry with the first insert 46, whereas if two such units are to be ejected, 60 the ring is adjusted a further step to bring an insulating space 60 into registry with the second insert 46 of the series, thereby bridg-65

the arm 40 will make contact with the secondary ring 56, while traversing the insert 46. Thus the apparatus may be adjusted to automatically dispense any number of measured units of the commodity within the 70 capacity of the governor or controller.

This governor or controller may be located at any convenient place upon the appa-ratus. In Figs. 2 and 3 it has been shown directly connected with the rotary pump and 75 supported upon the extension or pressure chamber of the base or housing 2. In Fig. 1 the governor or controller is shown mounted upon the top of the structure and actuated from the transverse shaft 20 which 80 receives motion from the drive shaft 14.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before \$5 enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and ar-rangement of parts without departing from the principle involved or sacrificing any of 90 its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the inven-95 tion is not limited to the specific details shown, but that the means and construction herein disclosed comprise but one of several modes of putting the invention into effect, and the invention is therefore claimed 100 in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described my invention I claim: 105

1. In an apparatus of the character described, a reservoir, a plurality of spiral conveyors communicating therewith, a chamber into which the conveyors discharge, an outlet conduit leading from the 110 chamber, a rotary valve member in said conduit driven in unison with the conveyors but of less capacity than the series of conveyors whereby back pressure will be created at the intake side of said rotary 115 valve, the flow of material under such pressure being resisted by said valve member, separated thereby into successive and measured charges of uniform size, the quantity of material discharged being de-120 termined by the operations of said valve member.

2. In an apparatus of the character described, the combination with a supply reservoir of two separate ejector mecha-125nisms communicating therewith and interconnected in series whereby one ejector supplies the other, the initial ejector being of ing the first insert 46 by moving the insulat-ing space 60 out of registry therewith, so that the second ejector acting to impede the

charging the material, at lower pressure, and means to operate said ejectors in unison, the quantity of discharge being 5 measured at the full capacity of the second ejector.

3. In an apparatus of the character described, a reservoir, an ejector communicating therewith dividing the discharged ma-

- 10 terial into successive charges of known capacity and conveyor means for supplying the material to the ejector in quantity greater than its capacity whereby said ejector will act to impede the normal flow
- 15 of the material under influence of the first ejector and will be operated at full capacity to discharge the material in known measured quantity.
- 4. In an apparatus of the character de-20 scribed, a reservoir, an auxiliary pressure chamber communicating therewith, means for discharging the contents of the reservoir, into said chamber under pressure, a discharge conduit and an intermediate

25 measuring chamber of known capacity communicating alternately with the pressure chamber, and with the discharge conduit for discharging the material from said pressure chamber in measured quantity.

- 5. In an apparatus of the character de-30 scribed, a reservoir, a plurality of spiral conveyors communicating therewith to simultaneously discharge the contents of the reservoir, a chamber common to all the
- 35 spiral conveyors into which each conveyor discharges the conveyed material under pressure, and a flow regulator resisting the pressure of the accumulation of material in said chamber, and operating to sever the outflow therefrom into a succession of 40

measured charges of uniform bulk. 6. In an apparatus of the character de-

- scribed, a reservoir, a pressure chamber communicating therewith, means for dis-45 charging the contents of the reservoir into said chamber under pressure, and a rotary valve of known capacity communicating with said pressure chamber, comprising a circular housing, an eccentrically mounted
- rotor therein, and reciprocatory blades 50 mounted in said rotor maintaining contact with the walls of the housing serving to sever the discharged material into a succession of measured charges, the discharge ca-55
- pacity of the valve being less than the receiving capacity of the pressure chamber, whereby the contents or the chamber will be maintained under pressure and valve supplied at full capacity to discharge the contents of the reservoir in measured quantity.

7. A dispensing apparatus for lubricant or the like, wherein an electric motor is utilized for actuating an ejector of known capacity to discharge the commodity operated upon from a supply reservoir, charac- of ejector discharge. 65

normal output of the first ejector and dis- terized by an automatic controller switch comprising a rotating arm actuated by the motor, a contact ring over which the arm travels, said arm and ring being included in the motor circuit, and spaced non-conduct- 70 ing areas in said contact ring engaged by the arm to open the motor circuit when the ejector has been operated sufficient to discharge a predetermined known quantity of 75 material.

8. A dispensing apparatus for lubricant or the like, wherein an electric motor is utilized for actuating an ejector of known capacity to discharge the commodity operated upon from a supply reservoir, charac- 80 terized by a controller switch for the motor comprising two relatively movable contact members actuated by said motor thru which the motor current is supplied, one of said members being adapted to break contact at 85 predetermined points in their path of travel whereby the motor will be arrested when the ejector has been operated sufficiently to discharge a predetermined quantity of material.

9. A dispensing apparatus for lubricant 90 or the like wherein an electric motor is utilized for actuating an ejector of known capacity to discharge the commodity operated upon from a supply reservoir, characterized by an electric driving motor, a 95 controller switch for the motor comprising two relatively movable contact members actuated by said motor thru which the motor current is supplied, said members being adapted to break contact at predeter- 100 mined points in their path of travel whereby the motor will be arrested when the ejector has been operated sufficiently to dis-charge a predetermined quantity of material, a shunt circuit connecting said rela- 105 tively movable contact members, and a manually operable circuit closer in said shunt circuit, by the momentary closing of which the motor may be reconnected for a 110 subsequent period of operation.

10. A dispensing apparatus for lubricant or the like, wherein an electric motor is utilized for actuating an ejector of known capacity to discharge the commodity operated upon from a supply reservoir, char- 115 acterized by a controller switch for the motor comprising two relatively movable contact members actuated by said motor thru which the motor current is supplied, said members being adapted to break the contact 120 at predetermined points in their path of travel whereby the motor will be arrested when the ejector has been operated sufficiently to discharge a predetermined quantity of material, a shunt circuit connecting 125 said relatively movable contact members, a coin controlled circuit closer in said shunt circuit by the closing of which the motor is set in operation for a succeeding period 130

5

11. A dispensing apparatus for lubricant veyors whereby a body of material under or the like, wherein an electric motor is utilized for actuating an ejector of known capacity to discharge the commodity operated upon from a supply reservoir, characterized by a controller switch for the motor comprising two relatively movable contact members actuated by the motor, one of said members comprising relatively mov-10 able sections simultaneously engaged by the other contact member, each section having

therein nonconducting areas at spaced in-tervals, the spacing of such areas of one section being different from that of the 15 other, the non-conducting areas being brought into registry successively by the relative adjustment of said sections, the non-registering areas of each section being bridged by the other section to afford a 20 continuous contact for the other contact member until it engages the registered nonconducting areas to arrest the motor after having driven the ejector sufficiently to discharge a predetermined quantity of ma-25 terial.

12. In an apparatus for dispensing plastic material in measured quantity, the combination with a reservoir of a plurality of spiral conveyors communicating therewith, 30 a compression chamber into which the conveyors discharge under pressure, a dis-charge conduit leading from the chamber having a capacity less than that of the conpressure will be accumulated within said 33 chamber, and a flow regulating device resisting the pressure of the accumulation of material within the chamber and permitting its escape only in measured quantity, and means for actuating the flow regulating de- 40 vice in unison with the actuation of the conveyors.

13. In an apparatus for dispensing plastic material in measured quantity, the combination with a reservoir and an ejector means 45 therefor, advancing the material under pressure, of a discharge conduit and a flow regulating device controlling the discharge outlet normally resisting the advance of material under influence of the ejector and 50 permitting the escape thereof in measured quantity, and means for actuating the regulator in accordance with the quantity of material advanced by the ejector means.

14. In an apparatus for dispensing lubri- 55 cant or the like, the combination with a supply reservoir, ejector means, a pressure chamber in which a quantity of the material is accumulated under pressure, a discharge conduit leading therefrom, and a 60 rotary measuring valve controlling the outflow from said chamber through said conduit.

In testimony whereof I have hereunto set my hand this 24 day of May, A. D. 1921. JACOB BALDNER.