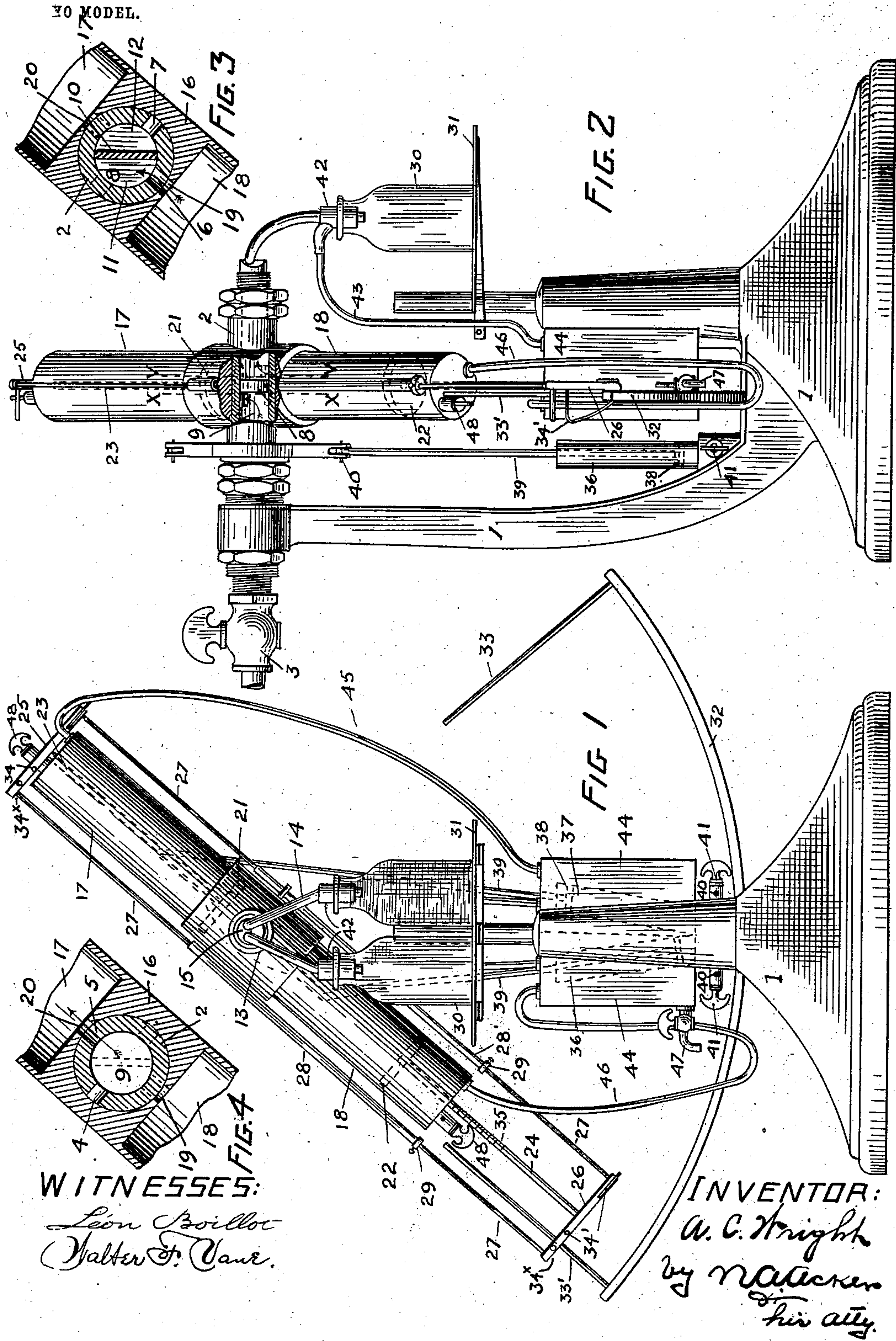


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A. C. WRIGHT.
MEASURING AND FILLING APPARATUS.

APPLICATION FILED JUNE 17, 1902.



UNITED STATES PATENT OFFICE.

ALLEN C. WRIGHT, OF BERKELEY, CALIFORNIA.

MEASURING AND FILLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 724,768, dated April 7, 1903.

Application filed June 17, 1902. Serial No. 112,035. (No model.)

To all whom it may concern:

Be it known that I, ALLEN C. WRIGHT, a citizen of the United States, residing at Berkeley, Alameda county, State of California, have
5 invented certain new and useful Improvements in Measuring and Filling Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the same.

The invention relates more particularly to
10 certain improvements for use in connection with the apparatus fully set forth in an application, Serial No. 89,962, filed by me in the United States Patent Office on the 16th day of January, 1902, the invention residing more es-
15 pecially in means whereby the cylinders are held against movement during the operation of filling and emptying, in the simplified construction of the valve means, in mechanism whereby the speed of the cylinders' rotation
20 is controlled, and in means whereby surplus material is automatically removed from the bottles or packages filled.

To comprehend the invention, reference should be had to the accompanying sheet of
25 drawings, wherein—

Figure 1 is a front view in elevation of the apparatus. Fig. 2 is a side view in elevation, partly broken away. Fig. 3 is an enlarged
30 detail broken sectional view on line *v v*, Fig. 2 of the drawings; and Fig. 4 is a similar view taken on line *x x* of said figure.

The numeral 1 is used to indicate any suitable style of support for the hollow spindle 2. With one end of this spindle connects the
35 valved supply-pipe 3, which leads from a suitable reservoir containing the liquid or syrup to be conveyed to the packages to be filled. Said spindle is provided with the outlet-ports 4 5 and the inlet-ports 6 7, the latter ports be-
40 ing formed in the under face of the spindle a slight distance beyond the outlet-ports 4 5. The outlet and inlet ports are separated by a partition-wall 8, fitted within the hollow spindle, which wall also serves to divide the in-
45 terior of the spindle into an inner and outer compartment. Of these compartments the inner one may be termed a "receiving-chamber" 9, which receives the fluid from supply-pipe 3, while the outer compartment may be
50 termed an "outlet-chamber." This outer chamber is subdivided by the vertical partition-plate 10 into two outlet-chambers 11 12,

into which extend, respectively, the outlet-spigots 13 14. With said chambers 11 12 communicate, respectively, ports 6 7. The
55 spouts or spigots 13 14 are secured to the plug 15, fitted in the outer end of spindle 2, said plug being united to the partition-wall 8 by the vertical partition-plate 10.

Upon the spindle 2 is mounted to revolve
60 the hub 16, which carries the opposing cylinders 17 18. In the hub 16 the ports 19 20 are formed, which ports communicate, respectively, with cylinders 18 and 17 and outlet-ports 4 5. Within cylinders 18 17 work the
65 pistons 21 22, the stems 23 24 of which project beyond the outer end of the cylinders and are connected to cross-heads 25 26. These cross-heads are adjustably connected by side
70 rods 27 to sleeve-rods 28 28', which sleeve-rods are secured to side rods 27 by set-nuts 29. By means of the cross-heads, sleeve-rods, and side rods the pistons of the cylinders are coupled together or connected so
75 that an inward movement of one piston causes an outward movement to be imparted to its opposing piston.

The liquid or fluid from the reservoir flowing into the receiving-chamber 9 through
80 valved supply-pipe 3 is forced therefrom by its head-pressure through one of the outlet-ports—say 4—and escapes into the uppermost cylinder 17 through port 20, so as to fill the said cylinder with the liquid flowing from the supply-reservoir. As this cylinder fills
85 with the liquid piston 21 is moved or forced outward, which through its connection with piston 22 causes piston 22 to move inward within its cylinder 18. Presuming the lower-
90 most cylinder 18 to be fitted with liquid, then the inward movement of piston 22 will expel the liquid therefrom by forcing same through port 19 and inlet-port 6 into chamber 11, from which the liquid escapes, through spout or
95 spigot 13, to the package 30, located thereunder, to be filled. The package or bottle to be filled may be held beneath the proper spigot by hand or by means of a platform 31, arranged for such purpose. By the time the
100 lowermost cylinder has emptied the upper cylinder will be filled with liquid and owing to the weight of the fluid contained therein will overbalance the empty cylinder, causing the hub 16 to turn over or make a part rota-

tion in order to place the lowermost or empty cylinder 18 in the uppermost position or in a position corresponding to that formerly occupied by cylinder 17. This movement or
 5 changed position of the cylinders closes ports 4 and ports 6 and opens or places in registry ports 19 and 5 and 20 and 7. The cylinders standing in this changed position, the fluid will then flow from receiving-chamber 9 into
 10 cylinder 18 through ports 5 and 19, forcing piston 22 outward. During this movement of piston 22, piston 21 moves inward within its cylinder so as to expel the liquid therefrom through ports 7 and 20 into chamber 12,
 15 from whence it escapes through spigot or spout 14 into the package to be filled. The moment cylinder 18 has become filled cylinder 17 will have been emptied of its contents, when the weight of the full cylinder will cause the
 20 turning or downward movement thereof in order to place the empty cylinder uppermost, when the operation first described is repeated. The normal position of the cylinders is such that the empty cylinder is uppermost during
 25 the filling of the packages. As one cylinder is being filled the companion or opposing cylinder is gradually freed of its contents. The rotation of the cylinders is due to the fact that the same are arranged at an incline to the
 30 vertical axis of the hub 16. Hence the moment the uppermost cylinder becomes filled with liquid its weight overcomes that of the lowermost cylinder and it turns over or revolves until it assumes a corresponding position with that previously occupied by its companion cylinder. During the filling of the upper
 35 cylinder it is required that the lower cylinder be held against movement, or, in other words, be locked, else the weight of the upper as it fills will overcome that of the lower
 40 cylinder when partially empty and revolve or move into the lowermost position. To provide against such movement, suitable means are provided to hold the lowermost cylinder
 45 locked against movement. A convenient and simple form of locking means is that illustrated by Fig. 1 of the drawings, which consists of a curved bracket 32, attached to and projecting from the support or base 1. From
 50 this bracket, near its outer ends, extend the posts or studs 33 33', with which engage one of the spring-catches 34 34', secured to the cross-heads 25 26, as the full cylinder is brought to a state of rest. The spring-catch
 55 34 of cross-head 25 of cylinder 17 engages with the post or stud 33, while spring-catch 34' of cross-head 26 of cylinder 18 engages with projecting stud or post 33'. These spring-catches are so arranged as to hold the lowermost
 60 cylinder at a slight incline, but against rotation. The cross-heads of the respective cylinders will be held in locked engagement with one of the projecting posts or studs until by the inward or upward movement its
 65 spring-catch is carried beyond or out of engagement with its engaged post or stud. As the inward or upward movement of the cross-

rod of the lower cylinder is proportionate to the outward movement of the cross-head of the uppermost cylinder, the cross-head of the
 70 lower cylinder will not be released from locked engagement until the cross-head of the upper cylinder has moved its full outward distance, which will be when the upper cylinder is filled and the lower cylinder emptied
 75 of its contents, due to the outward movement of the piston of the upper cylinder and inward movement of the lower cylinder. Stops 34^x, carried by the cross-heads, limit the excessive downward swinging of the cylinders
 80 beyond the catches 34 and 34'. When the upper cylinder stands full and the lower cylinder empty, the cross-head of the lower cylinder will be out of locked engagement. The weight of the upper cylinder will then cause
 85 the same to rotate or fall into the lowermost position, in which position it will be held locked against rotation by the spring-clamp of its cross-head engaging with the post or stud designed to hold said cylinder. Inas-
 90 much as the pistons of the cylinders work together or in unison it is obvious that the emptying of the lower cylinder and the filling of the upper cylinder is proportionate.

The quantity of fluid carried by the cylinders is dependent upon the size thereof; but
 95 I prefer to make same sufficiently large to hold about one gallon or more. The quantity of liquid admitted to and discharged from the cylinders is controlled by the stroke of
 100 the pistons working therein. To increase or decrease the stroke of the pistons, it is only required to adjust the rods 28 28' upon the connecting or side rods 27. In order that the operator may gage or regulate the
 105 quantity of fluid to be admitted into the cylinders, the piston-stems 23 24 have a scale-dial 35 thereon indicating liquid measure from half-pints or less up to one gallon or whatever may be the maximum measurement
 110 of the cylinders.

To properly cushion or regulate the rotary movement of the cylinder, air-cylinders 36 37
 115 are provided. Within these cylinders or chambers work the pistons 38, the rods 39 of which are connected to ears 40, projecting from hub 16. The admission of air within the cylinders 36 37 through ports 40 is regulated by means of the screw-valves 41. These
 120 valves as raised or lowered increase or decrease the area of ports 40, so as to control the air-pressure within the air-cylinders to govern the movement of the pistons therein.

The present invention is designed for the filling of packages with various kinds of liquids, as wine, brandy, whisky, extracts,
 125 medicines, tonics, syrups, and similar material. In order to insure the packages being filled to an even height, a sleeve 42 surrounds each spigot or spout, terminating a short distance from the end thereof. Each sleeve is
 130 connected by a tube 43 with a chamber 44. The chambers are also connected by flexible pipes 45 46 with the cylinders 17 18. As thus

connected the inward movement of the piston of the lowermost or exhausting cylinder—say cylinder 18—creates a suction through its flexible connection. In case the liquid discharged into the package reaches a point above the lower end of the shell of the discharging spigot or spout the same is immediately drawn off through said shell and its tube into one of the chambers 44 by reason of the suction created by the inwardly-moving piston. By this means waste of the material is avoided and the packages are filled to a uniform height. The material deposited within chambers 44 may be withdrawn by opening the draw-off cocks 47.

It is necessary that the air taken into the cylinders 17 18 during the inward stroke of the pistons working therein be exhausted upon the outward stroke of the said pistons. For this reason in each cylinder-head a valve 48, manually adjusted, is provided, which valve permits of air being expelled from the cylinders during the outward movement of the pistons.

Having thus described the invention, what is claimed as new, and desired to be protected by Letters Patent, is—

1. In an apparatus of the character described, two cylinders adapted to be automatically shifted to alternately register with a source of supply, pistons in said cylinders, piston-rods carried by the pistons, connecting instrumentalities exterior to the cylinders between the piston-rods whereby the admission of a filling material into one cylinder will eject the material from the other cylinder, and means for holding the cylinders locked against movement during the admission of material thereto.

2. In an apparatus of the character described, two rotatably-mounted cylinders adapted to be automatically shifted to alternately register with a source of supply, pistons in said cylinders, piston-rods carried by the pistons, connecting instrumentalities exterior to the cylinders between the pistons whereby the admission of a filling material into one cylinder will eject the material from the other cylinder, and devices for holding the cylinders against rotation while receiving and discharging material.

3. In an apparatus of the character described, two cylinders adapted to be shifted to alternately register with a source of supply, pistons in said cylinders arranged so that the admission of a filling material into one cylinder will eject the material from the other cylinder, adjustable connecting instrumentalities between the pistons whereby the charge in the cylinders may be regulated, and means for retaining the cylinders in position while receiving and discharging material; substantially as described.

4. In an apparatus of the character described, two rotatably-mounted cylinders adapted to be shifted to alternately register with a source of supply, pistons in said cyl-

inders arranged so that the admission of a predetermined amount of filling material into one cylinder will eject a corresponding quantity of material from the other cylinder, adjustable connecting instrumentalities between the pistons whereby the charge in the cylinders may be regulated, and means for holding the cylinders against movement while receiving and discharging materials; substantially as described.

5. In an apparatus of the character described, two cylinders adapted to be shifted to alternately register with a source of supply, pistons in said cylinders, connecting instrumentalities between the pistons whereby the admission of a filling material into one cylinder will eject the material from the other cylinder, adjusting means for regulating the quantity of the material received into and ejected from the cylinders, and means for holding the cylinders against movement while receiving and discharging material.

6. In an apparatus of the character described, two cylinders arranged in approximate alinement and adapted to be shifted to alternately register with a source of supply, pistons in said cylinders, piston-rods carried by the pistons, connecting-rods exterior to the cylinders between the pistons whereby the admission of a filling material into one cylinder will eject the material from the other cylinder, and means for holding the cylinders against movement while receiving and discharging material.

7. In an apparatus of the character described, two cylinders arranged in approximate alinement and adapted to be shifted to alternately register with a source of supply, pistons in said cylinders, connecting-rods carried by the pistons, means for adjustably connecting the adjacent ends of said rods, and means for holding the cylinders against movement while receiving and expelling their charges.

8. In an apparatus of the character described, two cylinders arranged in approximate alinement adapted to be shifted to register with a source of supply, pistons in said cylinders, connecting-rods carried by the pistons, sleeve-rods into the ends of which the adjacent ends of the rods project, means for holding said rods in adjusted positions in the sleeve, and means for holding the cylinders against movement while receiving and discharging material.

9. In an apparatus of the character described, two rotatably-mounted cylinders arranged in approximate alinement and adapted to alternately receive and discharge material from a suitable source of supply, pistons in said cylinders, connection between the pistons, locking means, and means carried by the pistons adapted to engage the locking means to retain the cylinders in an inclined position until the upper cylinder is filled and the lower cylinder emptied.

10. In an apparatus of the character de-

scribed, two rotatably-mounted cylinders arranged in approximate alinement and adapted to alternately receive and discharge material from a suitable source of supply, pistons in said cylinders and connecting instrumentalities between the pistons whereby the admission of filling material into one cylinder will eject the material from the other cylinder, holding means for said connecting instrumentalities to temporarily hold the same against movement to normally maintain the cylinders in an inclined position, whereby the upper cylinder when filled will automatically exchange positions with the lower cylinder.

11. In an apparatus of the character described, a plurality of rotatably-mounted cylinders adapted to alternately receive and discharge material from a suitable source of supply, pistons in the cylinders, connecting instrumentalities between the pistons whereby the admission of a filling material into one cylinder will eject the material from the other cylinder, holding means for said connecting instrumentalities to temporarily hold the same against movement to normally maintain the cylinder being filled at one side of the vertical plane of its axis of rotation whereby the said cylinder when filled will automatically shift in a rotary direction and exchange positions with the lower cylinder.

12. In an apparatus of the character described, two rotatably-mounted cylinders arranged in approximate alinement and adapted to alternately receive and discharge material from a suitable source of supply, pistons in said cylinders, connecting instrumentalities between the pistons whereby the admission of a filling material into one cylinder will eject the material from the other cylinder, and means associated with said connecting instrumentalities for normally maintaining the cylinders in an inclined position, whereby the upper cylinder when filled will automatically rotate and change positions with the lower cylinder previous to discharging material therein.

13. In an apparatus of the character described, two rotatably-mounted cylinders arranged in approximate alinement and adapted to alternately receive and discharge material from a suitable source of supply, pistons in the cylinders, connecting instrumentalities between the pistons whereby the admission of a filling material into one cylinder will eject the material from the other cylinder, and means automatically associated with the said connecting instrumentalities for maintaining the cylinders in an inclined position whereby the upper cylinder when filled will automatically rotate and change positions with the lower cylinder previous to discharging the material therein.

14. In an apparatus of the character described, two cylinders adapted to be shifted to alternately register with a source of supply, pistons in said cylinders, connecting instru-

mentalities between the pistons whereby the admission of a filling material into one cylinder will eject the material from the other cylinder, means intermediate of the cylinders for directing the material into and out of the same according to the position of the cylinders substantially as described, holding means, and means carried by the pistons for engaging the holding means to retain the cylinders at an inclination until the upper cylinder is filled and the lower cylinder emptied.

15. In combination with a rotatable valve-coupling, of the opposing cylinders carried thereby, communication between the coupling and the cylinders, pistons working within the cylinders, connection between the pistons whereby the outward movement of one piston causes the inward movement of the opposing piston, means for varying the stroke of the respective pistons whereby the admission of fluid into and the discharge of fluid from the cylinders is controlled, and spring-catches which engage with and hold the cylinders temporarily against movement while one cylinder is filling and its opposing cylinder emptying.

16. In an apparatus of the described character, a pair of cylinders adapted to alternately receive material from a common source of supply, pistons working in said cylinders, connecting instrumentalities between the pistons whereby the admission of a filling material into one cylinder will eject the material from the other cylinder, devices for receiving the discharged material and conveying the same to the package to be filled, and means controlled by the actuation of the pistons for withdrawing the material discharged in excess of the capacity of the package, substantially as described.

17. The combination with a hollow spindle provided with a plurality of inlet and outlet ports, of a hub rotatably mounted on said spindle, a plurality of cylinders carried thereby, ports in the hub which communicate with the cylinders, said ports alternately registering with an inlet and outlet port, pistons working in the cylinders, connecting means between the pistons whereby the admission of a filling material into one cylinder causes the material in the other cylinder to be ejected therefrom, devices for receiving the ejected material and conveying same to the package to be filled, and means controlled by the actuation of the pistons whereby such material delivered to the package as exceeds a given height is automatically removed therefrom.

18. In an apparatus of the character described, a plurality of cylinders which alternately receive and discharge material delivered thereto from a common source of supply, devices for receiving the discharged material and delivering the same to the packages to be filled, and means controlled by the actuation of the pistons whereby the material dis-

charged in excess of the quantity desired for the package is automatically removed; substantially as described.

19. In an apparatus of the character described, a charge-receiving device, means for discharging material therefrom, a receptacle arranged to receive the discharged material, and means controlled by the actuation of the discharging means for automatically withdrawing the material discharged in excess of the quantity desired for the package; substantially as described.

20. In an apparatus of the character described, a plurality of cylinders arranged to

alternately receive and discharge material, 15
pistons in said cylinders, holding means, means connected to the pistons arranged to engage the holding means to automatically hold the cylinders in position and be automatically released by the action of the pistons 20
to permit the shifting of the cylinders; substantially as described.

In witness whereof I have hereunto set my hand.

ALLEN C. WRIGHT.

Witnesses:

WALTER F. VANE,
D. B. RICHARDS.