R. J. WORKMAN.

MEASURING AND FILLING MACHINE.

APPLICATION FILED MAY 18, 1909.

961,741.

Patented June 14, 1910.

2 SHEETS—SHEET 1.

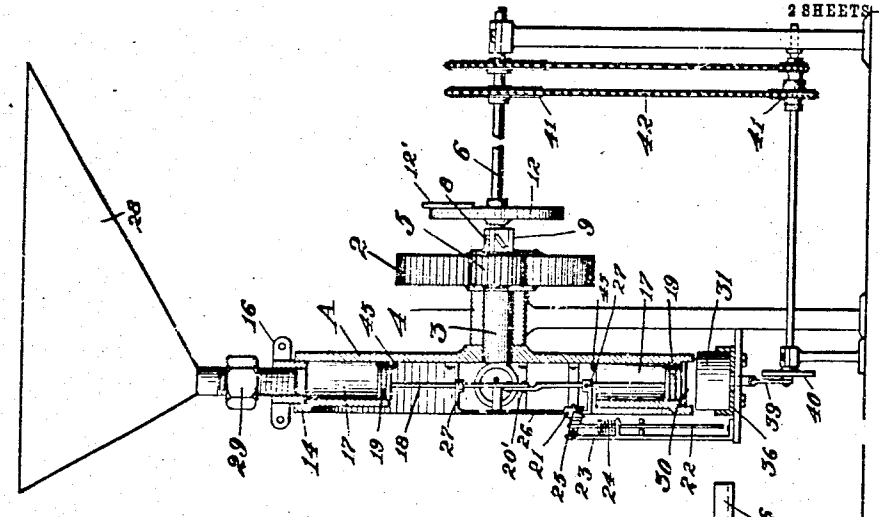

Fig. 2.

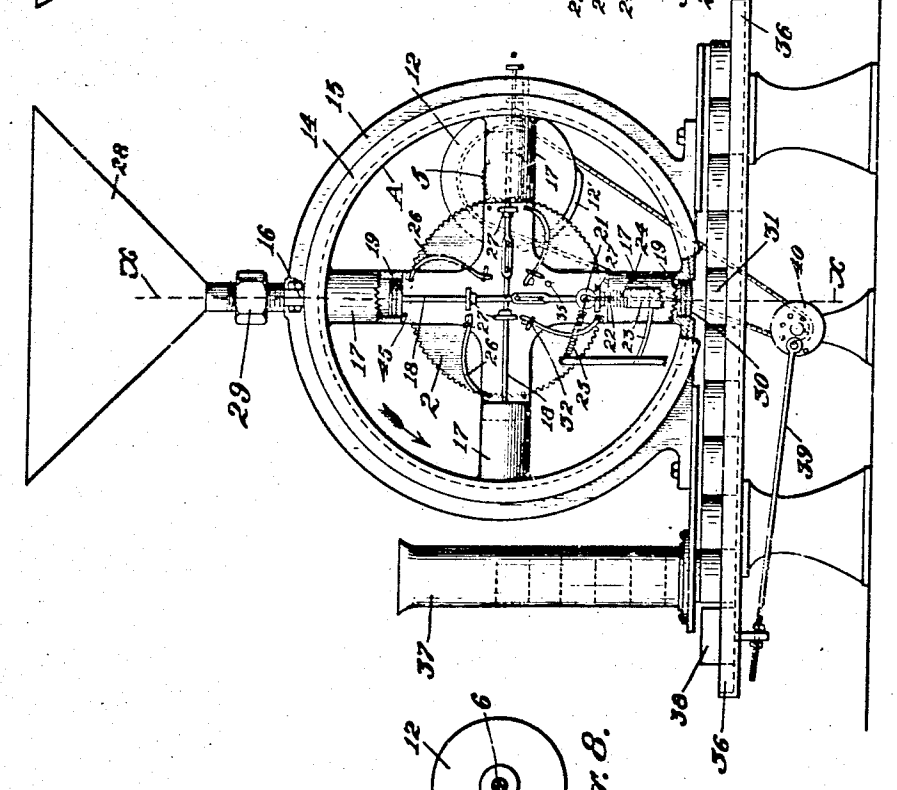

Fig. 1.

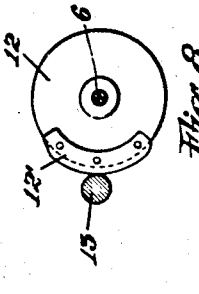

Fig. 3.

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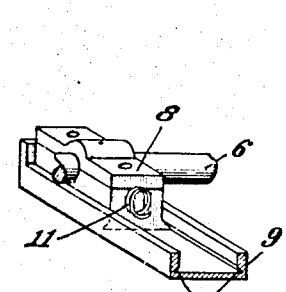

Fig. 6.

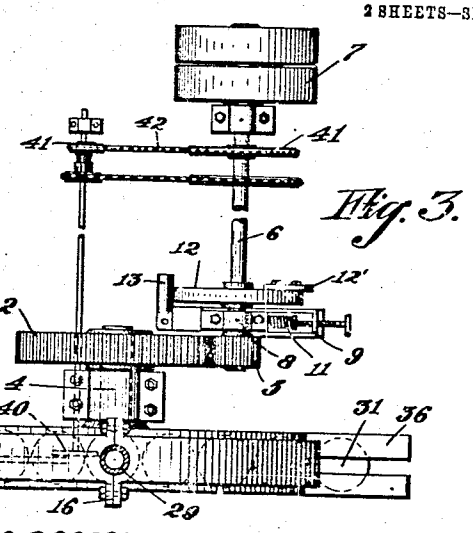

Fig. 3.

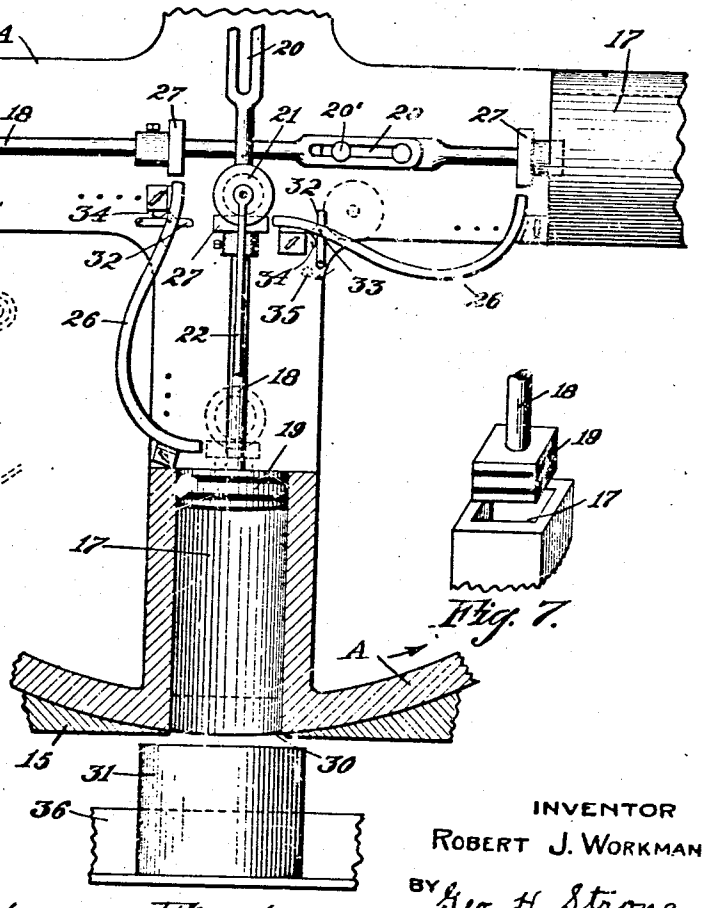

Fig. 4.

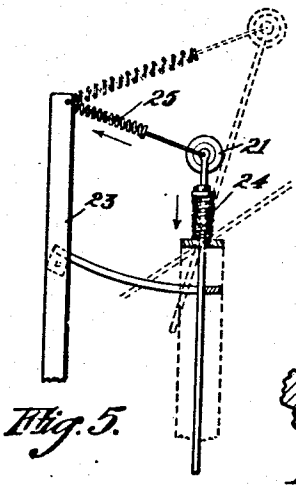

Fig. 5.

Fig. 7.

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UNITED STATES PATENT OFFICE.

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MEASURING AND FILLING MACHINE.

961,741. Specification of Letters Patent. Patented June 14, 1910.

Application filed May 18, 1909. Serial No. 496,808.

To all whom it may concern:

Be it known that I, ROBERT J. WORKMAN, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Measuring and Filling Machines, of which the following is a specification.

This invention relates to a machine for filling cans, jars, and the like with various substances, and particularly pertains to filling machines used in canneries for placing fruits, vegetables, soups, meats and the like into cans or other receptacles.

It is the object of this invention to provide a filling machine that is simple in construction and operation, and in which the substances handled are correctly measured so as to insure the proper amount of material being placed in each receptacle.

A further object is to provide a filling machine that is automatic and adjustable and which is so constructed that there will be no waste or loss of materials in the filling operations.

The advantages of a machine of this character are numerous, but chiefly lie in its labor saving and sanitary properties, as well as its rapidity of output.

In filling cans and the like by machinery it has heretofore proved a difficult matter accurately to measure the substances so as to deposit an equal amount in each can, the machines now in use being more or less unreliable in that regard.

In this invention I have devised a machine that is adjustable so that any desired quantity of material may be placed in a can and which is capable of filling any sizes or style of can or jar now in use.

The machine is designed to have interchangeable parts and attachments so that almost any kind of materials can be handled, such as liquids of various consistencies, powders, grains, or meats.

The invention consists of the parts and the combination and construction of parts or their equivalents as hereinafter more fully described and claimed, reference being had to the accompanying drawings in which:

Figure 1 is a side elevation of the invention with parts broken away. Fig. 2 is a section on the line X X Fig. 1, showing the driving shaft in elevation. Fig. 3 is a plan view. Fig. 4 is an enlarged detailed view of the measuring wheel. Fig. 5 is a detail of the device for actuating the plungers. Fig. 6 is a detail in perspective, of the slidable bearings. Fig. 7 shows a square plunger. Fig. 8, (Sheet 1) is a side view of the cam.

In the drawings, A is an intermittently rotated filling wheel, mounted on the end of a shaft 3 which carries a gear wheel 2; shaft 3 is mounted in a suitable bearing 4 on the frame of the machine. The gear 2 meshes intermittently with a pinion 5 on the driving shaft 6, Fig. 3, which latter is rotatable by any suitable means through the pulley 7. The engagement and disengagement of gears 2—5 is done by the following means: One end of the shaft 6 is mounted in a transversely slidable bearing block 8, particularly shown in Fig. 6; a channel 9 being provided with grooves 10 in which the base of the bearing 8 may slide. An adjustable spring 11 acts against the bearing 8 to retain gears 2—5 normally in mesh. A cam 12 is mounted on the shaft 6 in such manner that as it revolves the projecting cam piece 12′ is caused to slide over a stop 13, thereby forcing the bearing 8 along the slide or channel 9 so as to disengage the pinion 5 from the gear 2 and compressing spring 11; spring 11 returning the pinion 5 into engagement with gear 2 after the cam projection 12′ passes the pin 13. The shaft 6 is of such length that its flexibility will permit of the slight movement required at its machine end to disengage the pinion 5 from the gear 2. The other end of the shaft 6 may be mounted in a swivel bearing if required, or a fixed bearing, loosely fitting the shaft may be employed, as the movement of the shaft is very slight.

The rim of the wheel A is provided with the side rim flanges 14 so as to form a peripheral channel which contacts with the inner surface of the fixed band 15. This band is constructed in two parts, one end of each being secured to the frame of the machine, the other ends meeting at 16, where they are connected together, Fig. 1.

The wheel A is provided with diametrically opposed filling and measuring chambers 17, the outer ends of which open in the peripheral channel and against the

band 15. Except when a chamber 17 is beneath the filling hopper 28, and in line therewith to be filled, or opposed to the discharge opening 30, the chamber is sealed by reason of the close frictional contact of the stationary rim 15 with the mouth of the cylinder. Each cylinder is provided with a plunger 19, the plungers in diametrically opposed cylinders being connected by adjustable rods 18. These rods are made adjustable, as shown in detail in Fig. 4, by making them in sections and slotting them, as at 20, and locking the two sections together after being adjusted by suitable means, as the bolts 20', the object of this adjustment being to adapt the filling chambers to fill cans of different sizes. The plungers of each bar are operated in unison and synchronously with the movements of the wheel, so that each time the wheel is stopped the lowermost cylinder will discharge its contents through the opening 30 into the cans or other receptacles 31, while the topmost chamber will receive a predetermined quantity of fresh material from the hopper or other suitable feeding device represented by 28. The actuation of these plungers is effected as follows: Suitably positioned with respect to the discharge opening 30 in the rim 15 of the machine is a sliding bar 22, carrying a roller 21. The bar 22 is capable of a limited up and down sliding motion and of a limited pivotal motion in a plane parallel with the plane of the wheel in suitably slotted fixed guides 23 on the machine frame. A spring 24 has one end fixed to the stem 22 and the other end fixed to one of the guides 23 and acts normally to pull the roller 21 downward. Another spring 25 is suitably connected to the roller so that it will exert a backward as well as a downward pull on the roller when the latter is lifted up to a position represented in dotted lines, Fig. 5. This roller 21 is suitably positioned with respect to curved tracks 26 carried on the arms of the wheel and adjacent to the hub portion, so that at each quarter revolution of the wheel one of the tracks 26 will engage underneath the roller 21 and raise this roller upward against the tension of its springs 24 and 25 until the rear or innermost end of this track which carries the roller is in such position that when the roller rolls off the track 26 it will strike against a collar 27 on a plunger stem 18, whereupon the spring 24 will exert a downward pull radial to the wheel to move a pair of plungers and cause the lower plunger to expel the contents of its chamber out through the opening 30 and into the receptacle 31 to be filled. In order that the roller will not leave its track sooner than is desired, a suitable detent may be employed, such as represented at 32, which will normally be interposed across the track so as to form a stop to the complete traverse of the roller along the track, but which detent will be actuated at the right moment so as to let the roller come down on the collar 27 to actuate the plunger in the manner just described. This detent may take any suitable form, but as here shown it comprises a latch member 32 pivoted at 33 and operated on by a spring 34 normally to carry the detent over the track. As a track carrying the roller 21 approaches a horizontal position, Fig. 4, the detent is rocked by engaging with a fixed trip member 35, thereby allowing the roller to run off the track and upon the plunger collar 27.

The materials to be canned are fed to the filling and measuring chambers 17 from any suitable source of supply, as a hopper 28, through suitable connections as a union and nipple 29 secured to the rim band 15.

The cans or other receptacles to be filled are fed to the discharge 30 by the following means: An adjustable runway 36 is constructed beneath the wheel A in such manner that cans, jars or the like may be slid under the discharge opening 30. The height and breadth of this runway may be adjusted to accommodate any size or shape of can. The cans are fed to the runway through a magazine cylinder 37, which may be filled and replenished by any desired means. The magazine cylinder 37 has a diameter a little larger than that of the can used, so that the cans stand in a single column within the magazine cylinder. A feed block 38 slides in the runway 36, and under the magazine cylinder 37, and is reciprocated back and forth by means of a rod 39 mounted on a disk 40, rotated by suitable means, such as the sprockets 41 and chains 42, which connect the disk 40 with the drive shaft 6. The reciprocation of the block 38 across the mouth of the chute 37 is so timed through the gearing of the sprockets 41 that the block will be in its most rearward position at the moment a can is under the discharge 30 and being filled. The instant the can is filled the block is moved forward against a can 31, which causes the other cans in advance in the runway to be moved forward the width of a can which is the length of the movement of the block 38. The next can to be fed to the runway 36 from the cylinder 37 thus rests upon the block 38, which on being moved back allows the can to drop into the runway 36, there to be moved forward by the return stroke of the block 38. In this manner a continuous feed of cans to the discharge 30 is accomplished. The filled cans may be removed from the runway in any desired manner.

In operation, power being applied to the machine at 7, the substance to be canned is deposited in the hopper 28. The wheel A

is revolved through the gear 2 and pinion 5 until the mouth of a chamber 17 is directly below the inlet pipe 29, whereupon the substance flows or is drawn into the chamber 17 by the downward stroke of the plungers 19, as before described. The down stroke of the uppermost plunger 19 draws the material into its chamber 17, while the down stroke of the opposed plunger discharges the contents of its chamber, previously filled, through the outlet 30 into a can 31. During the small interval of time required for this operation, the wheel A is caused to stop by means of the cam 12 throwing the pinion 5 out of mesh with the gear 2. The friction of the band 15 is sufficient to act as a brake and stop the revolution of the wheel A as soon as the disengagement of the pinion is effected.

In the construction of this machine, the pinion 5 is so proportioned to the gear 2, that as the latter is revolved once, the former will be disengaged as many times as there are chambers 17 on the wheel A. In this manner the wheel A is caused to stop as each pair of chambers 17 becomes vertically opposed to each other, so that one is being filled while the other is emptied. The close contact of the band 15 to the rim of the wheel A, together with the flanges 14, prevents any leakage from the chambers 17 as the wheel revolves from the point of inlet to the discharge.

The plunger rods 18 being adjustable, permit of the plungers 19 being arranged in the chambers so as to increase or decrease the capacity of the chambers as desired. When it is necessary to fill a can of larger capacity than that of the chambers 17, the can feeding mechanism may be so adjusted through the sprockets 41 that a can will remain under the discharge 30 until two or more chambers 17 will have emptied their contents therein.

The plunger heads 19 are rounded to correspond with the periphery of the wheel A, and stops 45 are provided to limit the downward stroke, so that the knife edge of the discharge opening 30 will contact with the plunger head and remove any substance that may adhere thereto. This arrangement insures the complete emptying of the chambers 17, the knife edge also preventing the objectionable drip so common in machines of this nature.

It is manifest that this filling machine is readily adaptable to render it suitable for handling materials requiring a forced feed like mince-meat, or to handle granular dry substances, such as powders, cereals, and the like.

The machine as shown in the drawings is designed to fill cylindrical cans, but it is obvious that square or other formed cans could be as readily handled by changing the shape of the plungers 19 and chambers 17 to correspond; such, for instance, as seen in Fig. 7, which shows a square piston and a chamber for packing square cans.

Having thus described my invention, what I claim and desire to secure by Letters-Patent is—

1. A filling machine comprising an intermittently rotatable carrier having filling chambers therein, plungers in said chambers forming bottoms therefor, means connecting opposed plungers, the outer ends of the chambers open with a fixed segmental closure for said chambers, means for rotating the carrier, and means for operating the opposed plungers synchronously therewith, said plunger operating means being adjustable.

2. A filling machine comprising an intermittently rotatable carrier having filling chambers therein, plungers in said chambers forming bottoms therefor, means connecting opposed plungers, the outer ends of the chambers open with a fixed segmental closure for said chambers, means for rotating the carrier, and means for operating the opposed plungers synchronously therewith, said operating means for the plungers comprising a reciprocating device mounted independently of the carrier, with means on the carrier for positioning said device to engage the plungers to move them.

3. In a filling machine, the combination of an intermittently movable carrier having peripheral pockets, plungers in the pockets, means connecting opposed plungers so that they move in unison, a fixed segmental rim engaging the periphery of the carrier to close the pockets, means for operating the plungers, said last named means including a roller member yieldingly supported independent of the carrier, means carried by the carrier for lifting said roller member, and means for causing it to act on a plunger when released from said lifting means.

4. In a filling machine, the combination of an intermittently movable carrier having peripheral pockets, plungers in the pockets, means connecting opposed plungers so that they move in unison, a fixed segmental rim engaging the periphery of the carrier to close the pockets, means for operating the plungers, said last named means including a yieldingly supported member mounted independent of the carrier, and track members on the carrier engageable with said member.

5. In a filling machine, the combination of an intermittently movable carrier having peripheral pockets, plungers in the pockets, means connecting opposed plungers so that they move in unison, a fixed segmental rim engaging the periphery of the carrier to close the pockets, means for operating the plungers, said last named means including a rockable spring-actuated, reciprocating rod carrying a roller, tracks on the carrier engaging the roller to reciprocate the rod in

one direction, and means connected with the plungers engageable by the roller when the latter is released from said tracks.

6. In a filling machine, the combination of an intermittently movable carrier having peripheral pockets, plungers in the pockets, means connecting opposed plungers so that they move in unison, a fixed segmental rim engaging the periphery of the carrier to close the pockets, means for operating the plungers, a shaft upon which the carrier is mounted, a gear on said shaft, a countershaft, and a pinion thereon meshing with said gear, said countershaft having a fixed bearing at one end and a movable bearing at the pinion end, the movable bearing comprising a block operating in a suitable slideway, a spring acting on the block to carry the pinion and gear normally into mesh, and a cam member on the countershaft cooperating with means on the gear to disconnect the gear and pinion intermittently.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ROBERT J. WORKMAN.

Witnesses:
CLARENCE PENFIELD,
CHARLES EDELMAN.