No. 767,393. PATENTED AUG. 16, 1904.

W. H. DOBLE.

MECHANISM FOR FILLING AND SETTLING GOODS IN PACKAGES.

APPLICATION FILED MAR. 8, 1902.

NO MODEL. 4 SHEETS—SHEET 1.

Fig. 1.

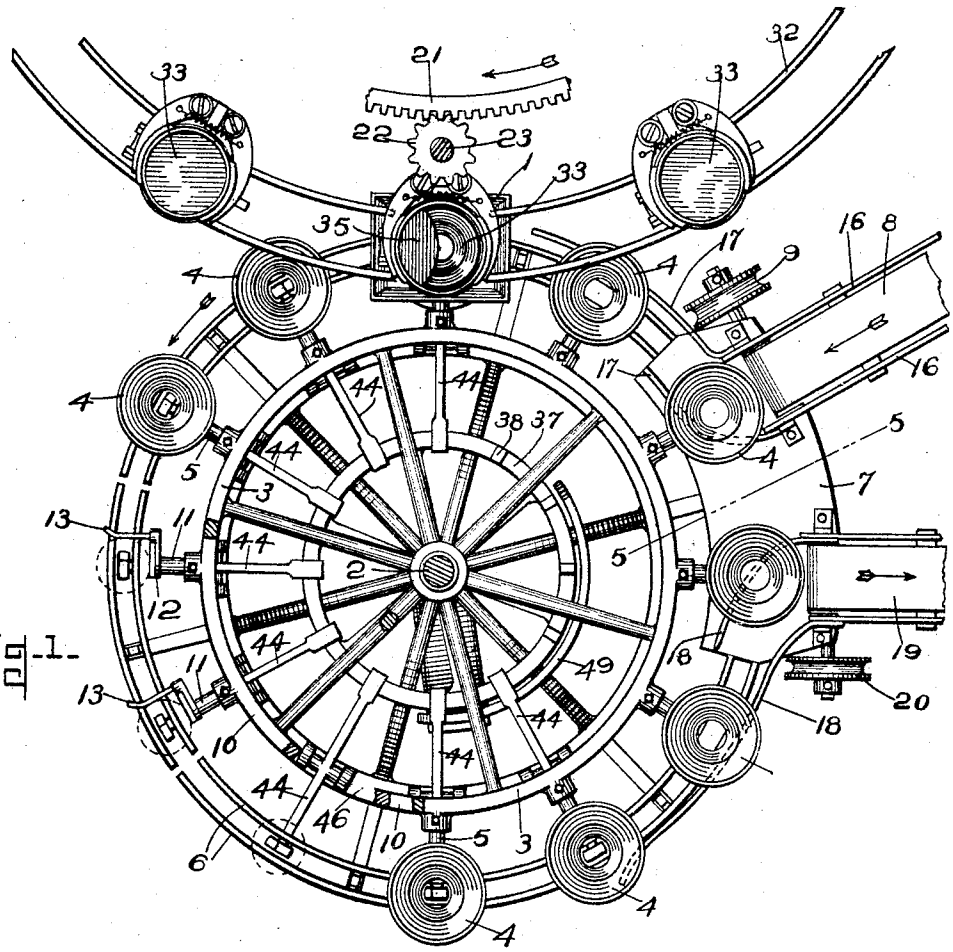
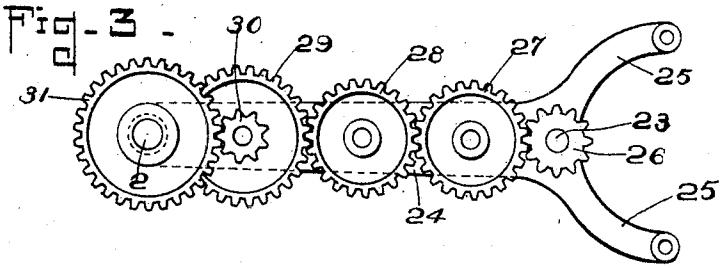


Fig. 3.



Witnesses.

Fred W. McCurdy

Chas. B. Crocker.

Inventor.

William H. Doble

by Wm A. Copeland.

Atty.

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NO MODEL. 4 SHEETS—SHEET 2.

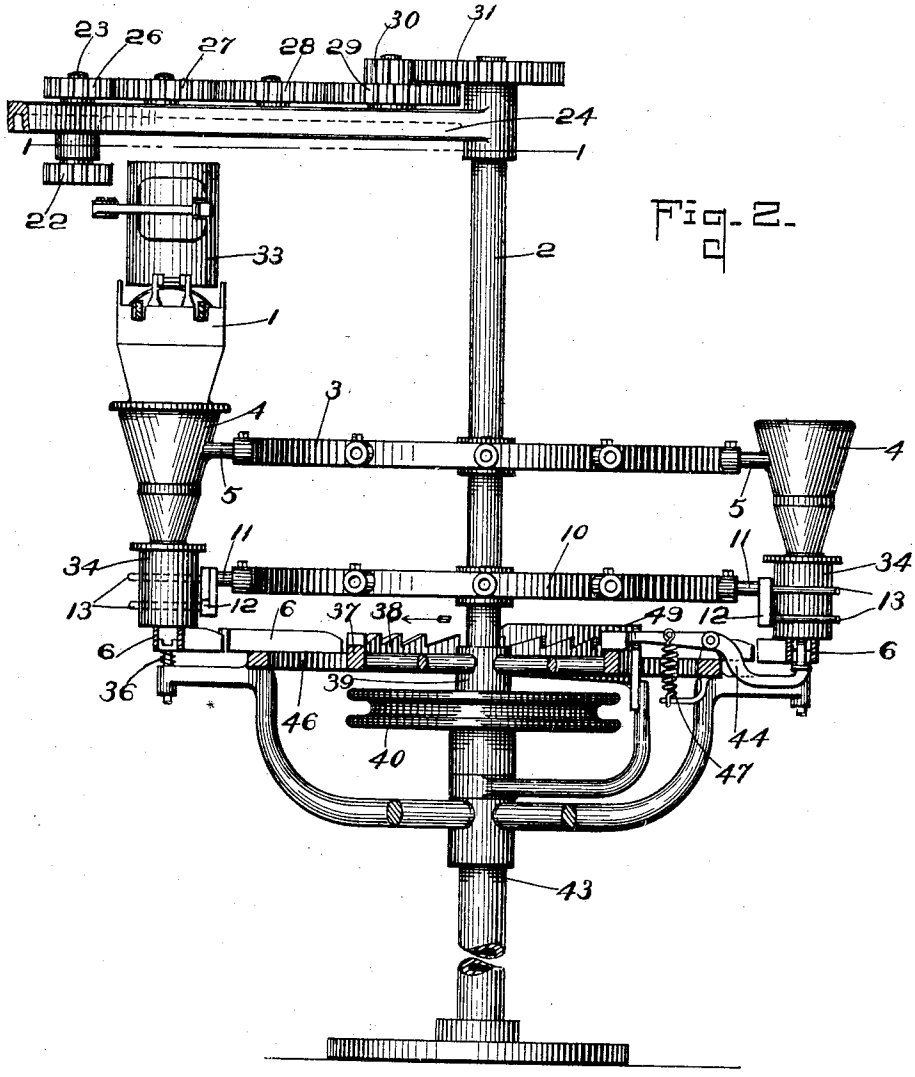


Fig. 2.

Witnesses.
Frederick W. Lindsley
Chas. R. Crocker.

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NO MODEL. 4 SHEETS—SHEET 3.

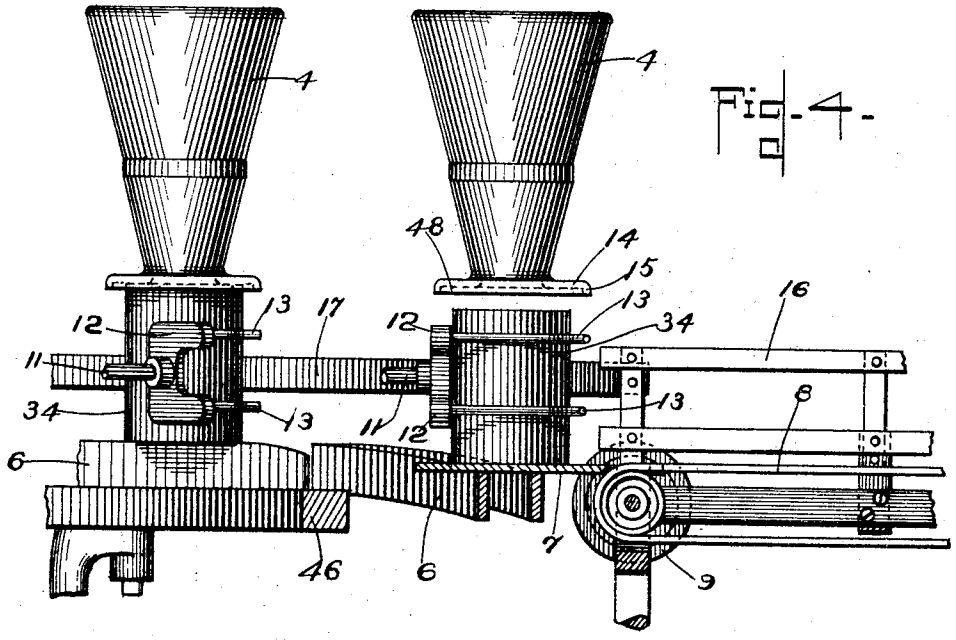


Fig. 4.

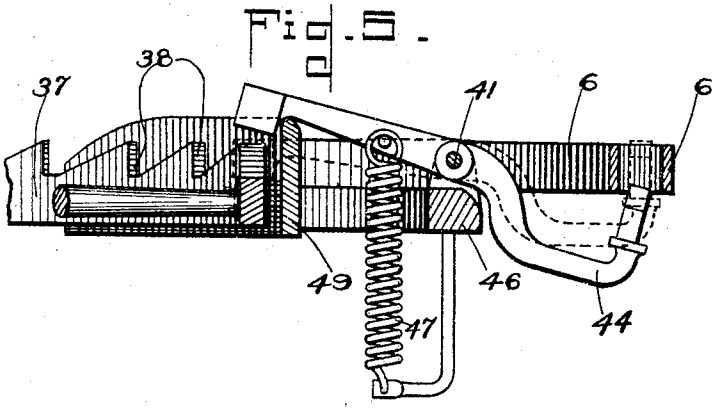


Fig. 5.

Witnesses.

Fred W. Hardy

Chas. B. Locker.

Inventor:

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NO MODEL. 4 SHEETS—SHEET 4.

Fig. 6.

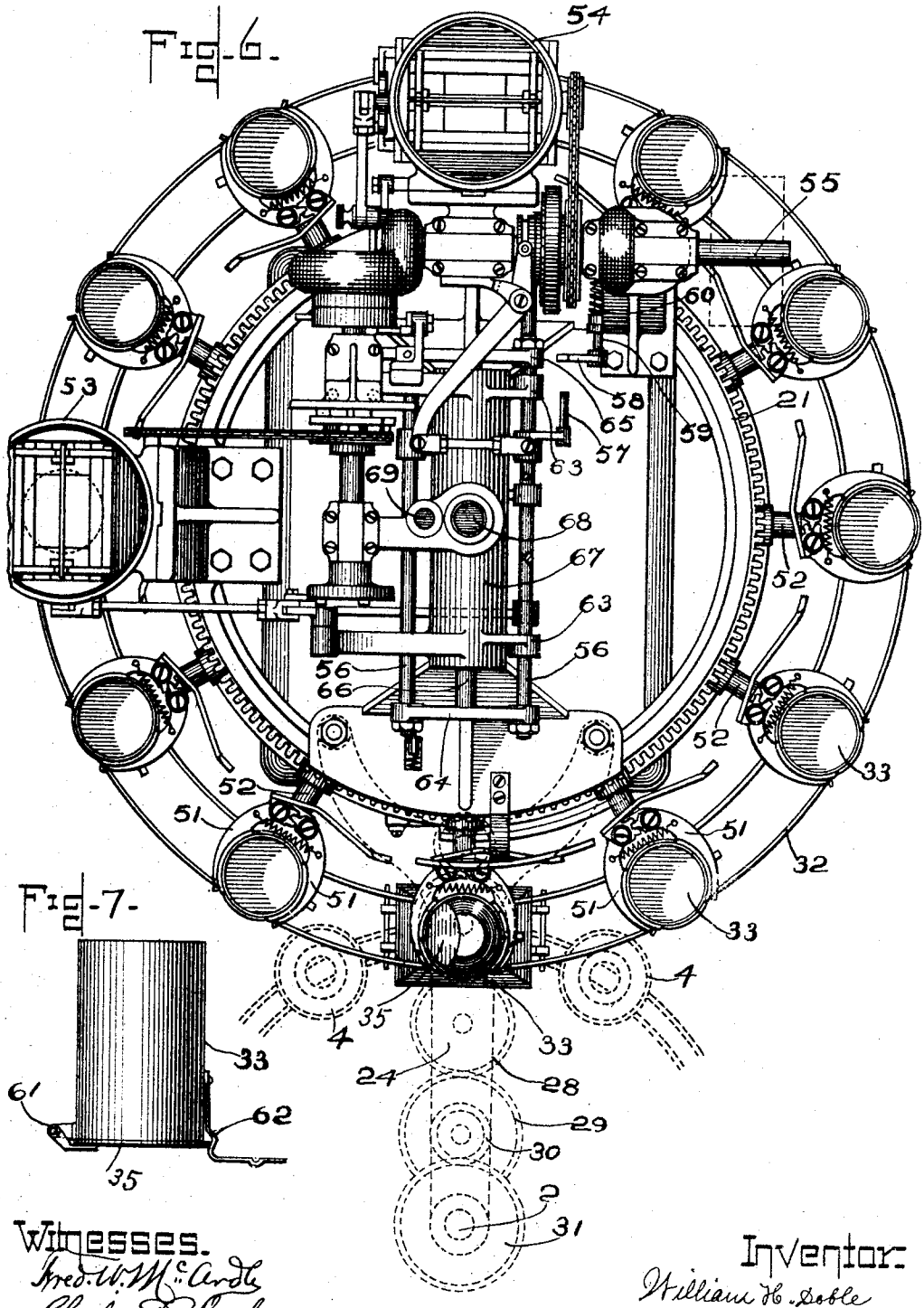


Fig. 7.

Witnesses.
Fred. W. McArdle
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Inventor:
William H. Doble
by Wm A. Copeland
attorney

No. 767,393. Patented August 16, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM H. DOBLE, OF QUINCY, MASSACHUSETTS, ASSIGNOR TO PNEUMATIC SCALE CORPORATION, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

MECHANISM FOR FILLING AND SETTLING GOODS IN PACKAGES.

SPECIFICATION forming part of Letters Patent No. 767,393, dated August 16, 1904.

Application filed March 8, 1902. Serial No. 97,289. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. DOBLE, a citizen of the United States, and a resident of Quincy, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Mechanisms for Filling and Settling Goods in Packages, of which the following is a specification.

The main object of this invention is to provide mechanism for packaging and settling goods in cans, packages, or other receptacles and also for securing complete discharge into the can or other receptacle of the intended quantity when the goods have first been weighed or measured out into a preliminary holder and are afterward emptied into the can or other receptacle.

It also has for its object other features, which will be set forth hereinafter.

The invention will now be fully described, and the novel features thereof will be particularly pointed out in the claims at the close of the specification.

In the best form of machine embodying the invention now known to me there are two rotary carriers mounted on the same vertical shaft and moving in unison, the lower carrier carrying the receptacles to be filled and the upper carrier carrying a series of funnels which are in alinement with the receptacles beneath. These funnels and receptacles are successively brought around into position to receive the load which is delivered to the receptacles through the funnels. The carriers move intermittently in unison with the carrier for the package-filling mechanism. Tapping mechanism is provided by which each package is tapped at periods of rest between the movements of the carrier. New receptacles are supplied to the carrier at the entrance as rapidly as the filled ones are removed at the place of exit. The funnels, however, continue the round of operations again.

In the drawings, Figure 1 is a plan, sectioned on line 1 1 of Fig. 2, of a machine embodying the invention in combination with a portion of a weighing or packaging machine in which the required weight or quantity of goods is first delivered into receptacles which are afterward emptied into the cans or packages. Fig. 2 is an elevation viewed from the left of Fig. 1. Fig. 3 is a detail plan of the train of gears which connect the shaft of the settling mechanism with the gear-ring of the weighing or packaging machine. Fig. 4 is a sectional detail on line 5 5 of Fig. 1. Fig. 5 is a sectional detail showing one of the tappers and the ratchet which operates the tapper. Fig. 6 is a plan of the mechanism for feeding the material into and weighing it in the temporary receptacles and for discharging into the permanent receptacles. Fig. 7 is a detail view of one of the temporary receptacles.

Referring now to the drawings, 1 is a hopper, suitably supported, into which the goods are emptied for delivery to the receptacles.

On the rotary shaft 2 is mounted a spider 3 in form of a spoke-wheel carrying a series of funnels 4, attached to arms 5, which project from the periphery of the spider. In the operation of the machine these funnels are successively brought beneath the hopper 1. Below the funnels 4 is a circular track 6, which extends around beneath the funnels and the hopper 1. Connected with the track is a table 7, onto which the receptacles 34 are fed by a carrier-belt 8, driven by a pulley 9.

Mounted on the shaft 2 is a spider 10 below spider 3 and of similar form to spider 3. Projecting from the periphery of spider 10 are arms 11, carrying finger-blocks 12, provided with fingers 13, which engage the receptacles and push them around on the track 6. The finger-blocks 12 are equal in number to the funnels 4 and are so located that the receptacles when engaged by the fingers 13 will be directly beneath the funnels and will be kept in the same relative position while the receptacles are carried around the tracks. Mechanism is provided, as hereinafter explained, by which the shaft 2, and consequently the spiders 3 and 10, are given an intermittent rotary movement, each movement being through an arc equal to the distance between two fun-

nels or two receptacles, and the mechanism is so adjusted that at each period of movement a receptacle is brought into position to receive goods from the hopper through one of the funnels. The fingers 13 project from the finger-blocks 12 near one edge of the block, as shown in Figs. 1 and 4, so that when the receptacle is delivered from the carrier-belt 8 onto the table 7 it will stand in the angle formed by the block and the fingers ready to be carried along on the track at the next movement of the shaft 2 and the spiders.

The funnels 4 are preferably formed with a flange-base 14, having a turned-down flange or lip 15 around the periphery. The under side of the base is preferably provided with a pad, of felt or other suitable material, surrounding the outlet, so that when the upper end of the receptacle is brought up against the base of the funnel the fine particles of the goods cannot escape during the discharge from the hopper. In order to permit bringing of the receptacle up close against the bottom of the funnel, the table is somewhat lower than the main part of the track, and the portion of the track which leads from the table is on an incline for a short distance, so that when the receptacle is delivered onto the table there will be a space between the top of the receptacle and the bottom of the funnel above it, as shown in Fig. 4. When the spider revolves, the receptacle will be carried up the incline of the track, and when the level track is reached the top of the receptacle is brought up against the bottom of the funnel. There are preferably guide-rails 16 at the sides of the carrier-belt 8. In order to guide the receptacles during the passage from the table and up the incline, guides 17 are provided. The track descends again where it approaches the table at the end of the circuit to allow the receptacle to be brought away from the funnel, and the receptacle passes between guides 18, which conduct it to the belt 19, which travels in the reverse direction to the belt 8 and is driven by pulley 20.

One form of mechanism for delivering the material into temporary receptacles and weighing it and discharging it into the permanent receptacles and giving intermittent movement to the shaft 2 and its actuated connections and which is the preferred means is as follows: A gear-ring 21 is made to revolve intermittently through a uniform distance at each period of movement. This can be done in well-known ways—such, for instance, as shown in Patent No. 633,675 to G. W. Watson, dated September 26, 1899, or Patent No. 556,231 to G. W. Watson, dated March 10, 1896, or in my application for United States Patent, filed February 13, 1902, Serial No. 93,886, in which the gear-ring is at rest while a package is being filled with a predetermined quantity of goods and which is moved after the scale tips. Engaging with gear 21 is a pinion 22, which is mounted on a stud 23, journaled in arm 24, the other end of said arm 24 forming a bearing for the upper end of shaft 2 and the forked ends 25 being secured to the frame of the weighing-machine or preliminary measuring-out machine. On the upper end of stud 23 is a pinion 26, which is connected by a train of wheels 27 28 29 and pinion 30 with a gear 31 on the shaft 2. The gears are so adjusted that at each period of movement of the gear 21 the shaft 2 will be revolved through the arc necessary to give the required movement to the spiders 3 and 10, as already explained.

Connected with the weighing or preliminary measuring-machine is a track 32, around which are carried receptacles 33, into which are successively delivered a predetermined weight or quantity of goods and which are moved intermittently by the action of the gear-ring 21, so as to bring a loaded receptacle 33 above the hopper 1 at the end of each period of movement of the gear-ring, which also brings one of the funnels 4 and one of the receptacles 34 beneath the hopper. Mechanism is provided by which the receptacles 33 are caused to discharge their contents into the hopper 1 and are then carried around to be refilled. This may be accomplished by forming the receptacles 33 with a valve 35 in the bottom hinged at 61, held by a catch 62, which is tripped when the receptacle reaches the proper position above the hopper and which is closed before the receptacle is again to be filled. In Fig. 7 the valve 35 is shown closed. In Figs. 1 and 6 the valve 35 is shown open, the receptacle 33 being then in a discharging position. The catch 61 may be tripped by engagement with a projection (not shown) between the rails of the track and re-engaged when the receptacle moves away from the place of discharge by engagement of the valve with the rails of the track. As shown in Figs. 1 and 6, the rails have an open place at the discharge-station to permit downward opening of the valve. The feature of continuously filled and discharged receptacles forms the subject of another application for Letters Patent.

The mechanism for delivering the material into temporary receptacles and weighing it and then transferring the temporary receptacles and discharging them into the permanent receptacles is shown in Figs. 6 and 7, although some of the details are omitted, as they will be understood by reference to other patents above mentioned. The temporary receptacles 33 are moved around on the track 32 by fingers 51, which are attached to arms 52, projecting from a flange on the intermittently-movable gear-ring 21. The machine shown in the drawings is of the two-feed type, in which the receptacle receives part of its required load through one hopper and is then transferred to the scale, where it receives the

remainder of its required weight. In the machine shown in Fig. 6 53 represents the preliminary supply-hopper and 54 the scale feed-hopper.

Gear-ring 21 is driven by driving-shaft 55 through suitable connecting mechanism, including mechanism, such as a clutch, (not shown,) by which the ring 21 may be thrown into and out of connection with the driving-shaft. A reciprocable member 56 opens and closes a valve to the scale-hopper 54. When the scale tips under the weight of the load in the receptacle, mechanism is actuated thereby, which causes the reciprocable member 56 to move forward and close the scale-hopper valve. When the frame 56 thus moves forward, a projection 57 on the reciprocable member 56 engages an arm 58, carried by a slide-rod 59, and causes said slide-rod to render operative the clutch which connects driving-shaft 55 with the shaft of a pinion which meshes with gear-ring 21. Said clutch and pinion and pinion-shaft are fully shown and described in Patent No. 633,253 to Watson, dated September 19, 1899. When the clutch connection is made, the gear-ring 21 is moved by said pinion until the clutch is disengaged. Slide-rod 59 is turned to bring arm 58 out of engagement with the reciprocable member 56, so that spring 60 will throw slide-rod 59 back before the said pinion has completed its revolution, and thereby actuate mechanism to stop the pinion at the end of one revolution. The size of the pinion determines the arc through which the gear-ring 21 moves at each cycle of operations. The receptacle-moving finger-arms 52 should be spaced so that at each period of movement a receptacle will be deposited on the scale.

Mechanism is provided which is actuated by the tipping of the scale to move the reciprocable member 56 forward to close the scale-hopper valve and which is actuated to move said member 56 rearwardly to open the hopper-valve when a new receptacle is deposited on the scale. There are various well-known ways in which this may be done. In Patents Nos. 633,675 and 633,253, above mentioned, the reciprocable member is electrically operated. In Patent No. 556,231 and in my application Serial No. 93,886 the reciprocable member is actuated by fluid-pressure. The machine shown in Fig. 6 of the accompanying drawings is especially designed to be operated by fluid-pressure; but any of the mechanisms shown in the patents above mentioned may be applied to it.

The two side bars 56 of the reciprocable frame are slidably mounted in bearings 63 and are connected with each other at the ends by cross-heads 64 65. Connected with the rear cross-head 64 is a piston-rod 66, which connects with a piston (not shown) in cylinder 67. Connected with forward cross-head 65 is a piston-rod which connects with a piston in the forward part of said cylinder 67.

A vertically-movable piston 68 is operated by fluid-pressure admitted to the chamber of piston 68 through pipe 69, said piston 68 being operated by mechanism (not shown) which is actuated by the tipping of the scale to admit pressure to move the reciprocable member forward and actuated by mechanism after a receptacle reaches the scale to admit pressure to move the reciprocable member rearward.

The spiders 3 and 10 are preferably adjustably clamped to the shaft 2, so that they may be set according to the capacity of the receptacles to be filled.

As there will sometimes be a slight variation in the weight of receptacles which are intended to be of the same size and as it is desirable to have the receptacle fit close up to the padded bottom of the funnel in order to provide for such slight variation and still retain the close joint, the track 6 is preferably made somewhat yielding, as by having the track supported on springs 36.

The mechanism for tapping the receptacles to settle the goods will now be described.

Loosely mounted on shaft 2 is a wheel 37, having crown ratchet teeth or cams 38. On the hub 39 of this wheel is a pulley 40, by which the wheel 37 is continuously revolved. Mounted on pivots 41 in brackets fixed to the standard 43 are a series of levers 44, the inner ends of which extend inward, so that their under sides are engaged by the ratchet-teeth 38 and caused to continuously vibrate up and down. The outer arm of the lever is bent upward, so that its end will form a tapper, which as it vibrates will move up and down between the rails of the track 6. Tension is given to the levers by means of springs 47, thereby causing quick action and sharp blows by the tappers. The levers are so disposed that the vibration will cause the tappers to strike the bottoms of the receptacles 34 when the spider which moves the receptacles is at rest. The number and arrangement of the tappers should be such that the receptacle will be engaged by the first tapper when the receptacle is under the hopper and will be engaged by additional tappers at each time of rest until it comes around near to the table where it is transferred to the removable belt, the series of tappers being arranged in a circle concentric with the path of movement of the receptacles. Thus the receptacle is subjected to a much more thorough settling process than if it is tapped merely while being filled. In the device shown in the drawings there are twelve arms to each spider, showing that there will be twelve periods of movement, nine of which are between the hopper and the place of deposit again on the table, and there are eight

tappers. Not only will the receptacles be shaken, but the vibration will be communicated to the funnels resting on the tops of the receptacles, and thereby shake down any material which otherwise clings to the sides of the funnel.

It is obvious that the apparatus may be connected with a machine in which goods are first measured out into preliminary receptacles as well as when weighed.

The teeth 38 instead of being of ratchet form may be corrugations or other form of projections from the crown of the wheel.

With some classes of goods it may not be necessary or desirable that the receptacle should be subjected to tapping by the whole series of tappers. Mechanism is therefore provided by which a portion of the tappers can be thrown out of operative action. A segmental rest 49 is mounted on a sleeve outside of shaft 2 and is capable of being turned around on its center and by means of a set-screw or other suitable clamping mechanism held in its adjusted position. It extends up above the ratchet-teeth 38 enough so that wherever the rest 49 is placed the tappers will rest on it and it will prevent the teeth 38 from engaging and actuating the tappers. If it is desired to put into operation all of the eight tappers shown in the drawings, the segment 49 is turned around, so that it will be on that side next to the entrance and exit where there are no tappers. It can be moved so as throw out of action one, two, three, or four tappers. Of course the form and size of the rest may be varied, so as to be capable of throwing out of action more or less of the tappers.

The temporary receptacles may be of any suitable form or material, and for the sake of brevity they will in some of the claims be referred to as "dummies," and for the same reason the word "can" will be understood as representing any sort of receptacle to be filled which has been referred to in the specification as the "permanent receptacle."

What I claim is—

1. In combination, in a packaging-machine, a rotating package-carrier, a series of fixed pivoted tapping-levers grouped about a center and adapted to engage successively with the packages, and a continuously-rotating member having projections which engage and actuate said tapping-levers, substantially as described.

2. In combination, in a packaging-machine, a series of tapping-levers grouped about a center, a toothed wheel continuously rotating on an axis central with said group of tappers and actuating said tappers, substantially as described.

3. In combination with packaging mechanism, an intermittently-rotating carrier for moving the filled receptacles in a circular path, a series of tappers adapted to engage the receptacles at different stages in their path of movement, a wheel rotating on the same axis as the carrier having teeth which engage said tappers, and mechanism which actuates said toothed wheel independently of the receptacle-carrier, substantially as described.

4. In combination, package-filling mechanism, a receptacle-carrier which moves the receptacles intermittently in a circular path after being filled, a series of fixed tappers adapted to engage each receptacle in succession at different points in its path, and mechanism which actuates said tappers, said tapper-actuating mechanism being independent of the mechanism which actuates the receptacle-carrier, substantially as described.

5. In combination, a package-carrier, mechanism for moving the said carrier, a series of pivoted tapping-levers grouped about a center, a continuously-rotating member having projections which engage and actuate said tapping-levers, and mechanism for continuously rotating said tapper-actuating member, substantially as described.

6. In combination with packaging mechanism, a carrier for removing the filled receptacles, a series of fixed tappers pivotally mounted beneath the path of the receptacles and mechanism which causes the tappers to tap the bottoms of the receptacles, said tapper-actuating mechanism being independent of the carrier-actuating mechanism, substantially as described.

7. In combination with packaging mechanism, a rotary carrier for removing the filled receptacles, a series of stationary tappers each adapted to successively engage the bottoms of the filled receptacles, and mechanism for actuating the tappers independently of the movement of the carrier, substantially as described.

8. In combination with packaging mechanism, a rotary carrier for removing the filled receptacles, mechanism for rotating the carrier intermittently, a series of stationary tappers each adapted to successively engage the bottoms of the filled receptacles between the intervals of movement, and mechanism for continuously actuating the tappers independently of the movement of the carrier, substantially as described.

9. In combination with packaging mechanism, a series of tappers, mechanism for actuating the tappers, mechanism for moving the filled packages so that each is successively engaged by the same tappers, and mechanism for varying the number of tappers in action, substantially as described.

10. In combination with packaging mechanism, a rotating carrier for the filled receptacles, a series of pivoted tapping-levers each adapted to successively engage the receptacles at different points in their path of movement, a rotating toothed wheel which actuates the tappers, mechanism which operates said toothed wheel independently of the movement of the carrier, and adjustable mechan-

for varying the number of tappers in action, substantially as described.

11. In combination with packaging mechanism, a rotating carrier for the filled packages, a series of pivoted tapping-levers each adapted to successively engage each receptacle, a rotating toothed wheel for actuating the tappers, and adjustable mechanism for varying the number of tappers in action, substantially as described.

12. In a packaging-machine, a rotary receptacle-carrier which moves the receptacles intermittently in a circular path, a rotary funnel-carrier moving on the same axis as the receptacle-carrier above the receptacle-carrier and at the same speed, a funnel in alinement with each receptacle and mechanism which causes the carrier to bring each receptacle up beneath its funnel, filling mechanism, and a series of tappers operated independently of the carrier-actuating mechanism and adapted to engage each receptacle at different points in its path of movement after being filled, substantially as described.

13. In a weighing and packaging machine, weighing mechanism, a receptacle-carrier, temporary receptacles for the weighed material moved by said carrier, mechanism actuated by the tipping of the scale to move said carrier so as to carry said temporary receptacles to a place of discharge and thence to a position for again filling, a carrier which brings permanent or packaging receptacles into position to receive the material when discharged from the temporary receptacles, and mechanism actuated by the tipping of the scale to move the permanent receptacle-carrier, substantially as described.

14. In a weighing and packaging machine, weighing mechanism, temporary receptacles for the weighed material, a carrier therefor, mechanism actuated by the tipping of the scale to move said carrier so as to transfer said receptacles successively to a place of discharge and thence again to a position for loading, mechanism for discharging said receptacles, a carrier which brings permanent receptacles into position to receive the material from the temporary receptacles, and mechanism actuated by the tipping of the scale to move the permanent receptacle-carrier, substantially as described.

15. In a weighing and packaging machine, weighing mechanism, a receptacle-carrier, temporary receptacles for the weighed material moved by said carrier, mechanism actuated by the tipping of the scale to move said carrier so as to carry the filled temporary receptacles to a place of discharge and thence again to a position for loading, mechanism for discharging said temporary receptacles into permanent receptacles, a carrier which brings permanent receptacles into position to receive the material from the temporary receptacles, mechanism actuated by the tipping of the scale to move the permanent receptacle-carrier synchronously with the temporary receptacle-carrier, a series of tappers, and mechanism which causes each one of a plurality of tappers to engage in succession the filled permanent receptacles during the periods of rest while other receptacles are being filled, substantially as described.

16. A package-filling machine having in combination, a carrier carrying a series of dummies, means for filling said dummies with a predetermined weight of material, means for intermittently rotating and stopping said dummy-carrier, can-carrying means, connections between said dummy-carrier and said can-carrier so that the dummies and the cans are moved synchronously, and means for dumping the dummies into the cans.

17. A machine adapted to put a predetermined weight of material into a can, having in combination, dummy-carrying mechanism, dummies of equal weight in which the material is weighed, can-carrying mechanism, connections between said carrying mechanisms, and intermittent rotating means for moving said carrying mechanisms in unison, and means to discharge the dummies into the cans.

18. A machine for placing a predetermined weight of material in cans having in combination dummy-carrying mechanism, dummies of equal weight in which the material is weighed, mechanism for carrying the filled dummies to discharging position, means for discharging the dummies, and can-carrying means for bringing the cans into position under the dummies when discharging.

19. A can-filling machine having in combination a series of dummies, dummy-carrying mechanism, can-carrying mechanism, connections between said carrying mechanisms, mechanism for rotating said carrying mechanisms intermittently and in unison and presenting a can beneath a dummy at a given point in its path when the carriers come to a rest, mechanism for supplying the dummies in succession with a predetermined weight of material, and mechanism actuated by the weight of the dummy when it is filled to the required amount to start the carriers.

20. A can-filling machine having in combination a series of dummies of equal weight, dummy-moving mechanism, can-moving mechanism, means for discharging the dummies into the cans and tappers to tap the filled cans.

21. A can-filling machine having in combination a series of dummies of equal weight, dummy-moving mechanism, can-moving mechanism, means for discharging the dummies into the cans and tappers to tap the filled cans at several points in their path of travel.

22. A can-filling machine having in combination a dummy-carrying ring, dummies of equal weight which are weighed with the material, means for presenting a can beneath a

dummy at a given point in its path, and means for discharging the dummy at that point.

23. A can-filling machine having in combination dummies of equal weight, a dummy-carrying ring, a can-carrying device, said device being located at one side of said ring, and intermittently-actuating means for operating said ring and device synchronously, whereby the cans are brought successively into a position beneath successive dummies and a series of tappers arranged to tap the cans at several points after having been filled.

24. A can-filling machine having in combination can-carrying means, funnels, means to bring the tops of the cans and the bottoms of the funnels tightly together, devices to dump a predetermined weight of material into the funnels and a series of tappers to tap the bottoms of the cans located at several points over which the filled cans pass, whereby the portion of the goods remaining in the funnel is tapped into the can before its removal from the machine.

25. A packaging-machine having in combination a series of tappers grouped about a center, intermittently-operated can-carrying means, devices independent of the can-carrying means for operating said tappers, and mechanism for throwing more or less tappers out of action.

26. In combination, in a packaging-machine, a can-carrier which moves in a circular path, mechanism for moving the can-carrier intermittently, a series of tappers arranged in a circle concentric with the path of movement of said can-carrier whereby the cans are tapped at several points in their path of travel, mechanism independent of the can-carrying mechanism for operating said tappers, and mechanism for throwing a variable number of the tappers out of action.

27. A packaging-machine having in combination can-carrying means, a series of tappers to tap the cans, and mechanism adjustable for throwing one or more tappers out of action.

28. A packaging-machine having in combination can-carrying means, a series of tappers, each can being tapped by a single tapper at any one position, and mechanism for throwing one or more tappers out of action.

29. In a weighing and filling machine, in combination, a circular table, a revolving frame carrying a plurality of receiving-hoppers, means for positioning a package under a hopper and moving it over the table with the hopper, tappers supported beneath the table to act on said packages and a revolving ratchet-wheel to operate said tappers, substantially as described.

30. A can-filling machine having in combination a series of dummies of equal weight, dummy-carrying mechanism, can-carrying mechanism and means for discharging the dummies into the cans.

31. In a weighing and filling machine, in combination, delivering and discharging belts and a tapping mechanism, and connected driving mechanism for operating the tapping mechanism and for driving the delivering and discharging belts in opposite directions, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

WILLIAM H. DOBLE.

Witnesses:

WILLIAM A. COPELAND,

WILLIAM S. SCALES.