

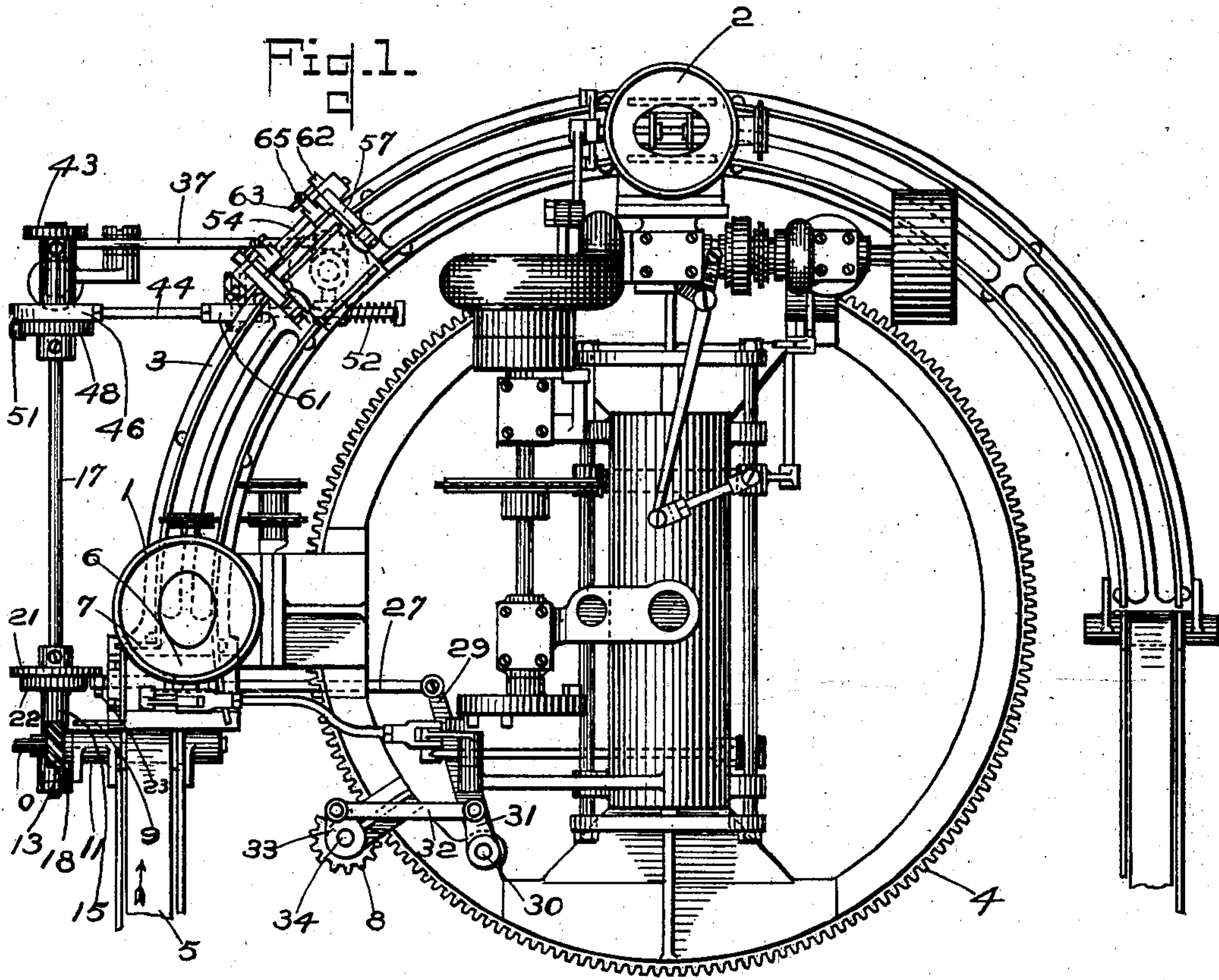
No. 708,627.

Patented Sept. 9, 1902.

W. H. DOBLE.
PACKAGING MACHINE.
(Application filed Apr. 3, 1902.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses.

Charles B. Crocker
Frederic W. Crocker

Inventor.

William H. Doble
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att'y

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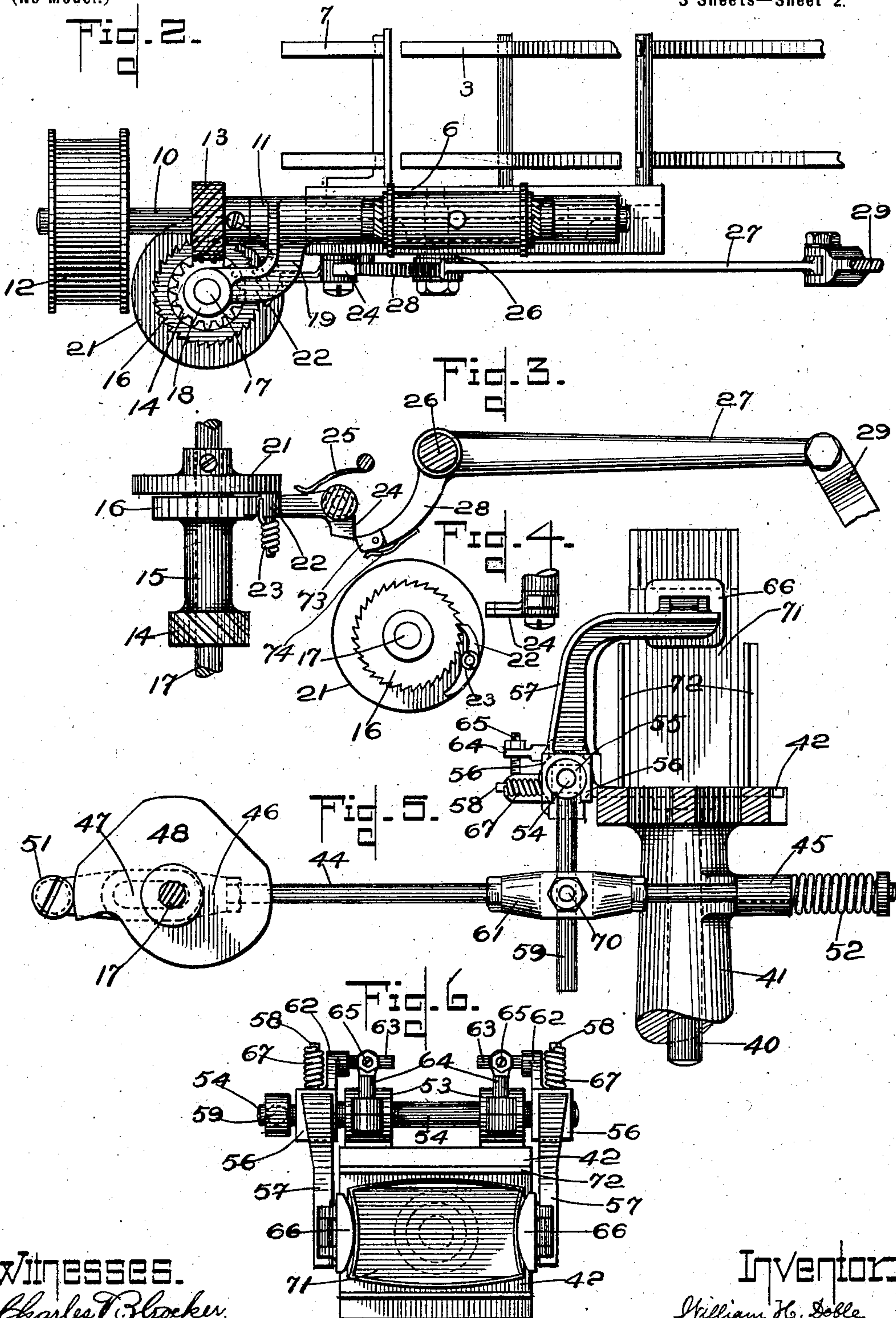
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Witnesses.

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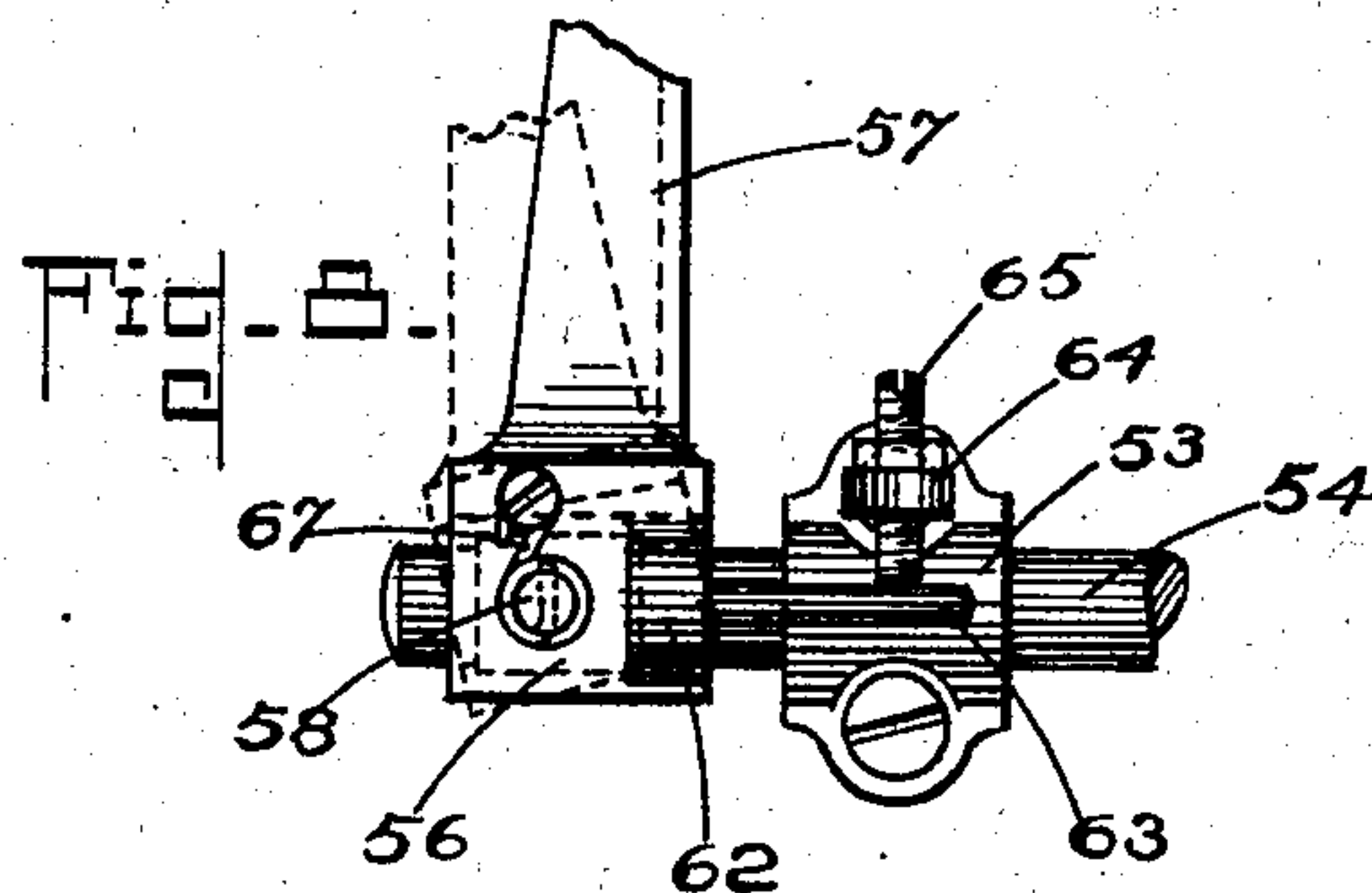
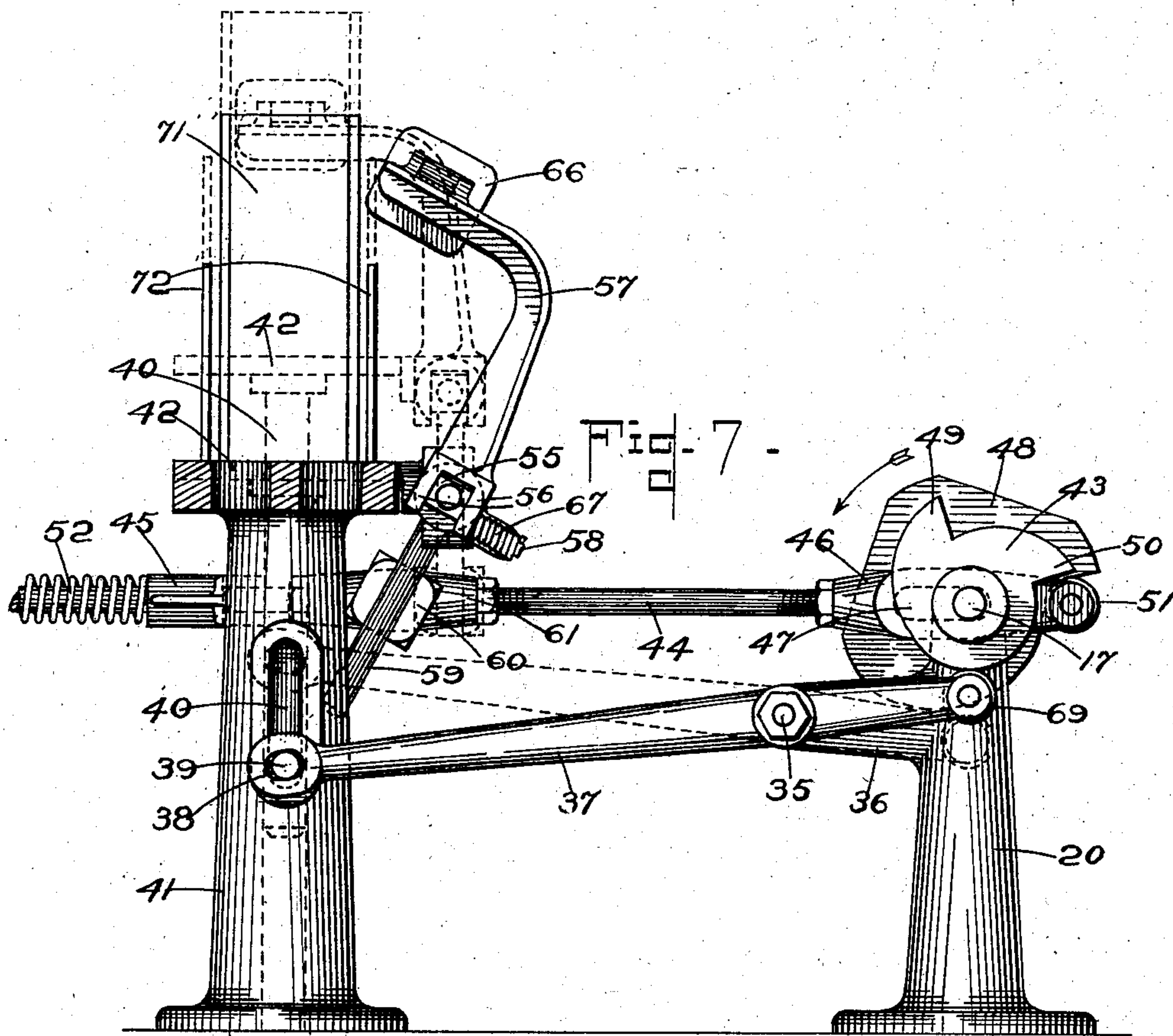
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Witnesses.

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UNITED STATES PATENT OFFICE.

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

PACKAGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 708,627, dated September 9, 1902.

Application filed April 3, 1902. Serial No. 101,253. (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 Packaging-Machines, of which the following is a specification.

When goods are put up in packages by machines without shaking them down, there is a tendency for the goods to lie loose and to require a larger package to hold the intended quantity than is necessary if some means be employed for settling the goods before the filling is completed. If a package is large enough to hold the goods in the loose form, not only do the packages occupy more space than will be required if the goods are packed compactly in smaller packages, but the handling about of the packages after the filling will cause the goods to settle, and then they will shake around in the package.

One object of the invention is to settle the goods in a partially-filled package while it is halted in its travel from the place where it receives its partial load to a place where it receives an additional supply of material.

Certain classes of goods—such, for example, as dried currants—require treatment somewhat different from the ordinary shaking or tapping process; and another object of this invention is to so handle the goods as to produce automatically the same result as when the operative settles them by hand.

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

In the drawings, Figure 1 is a plan of a machine embodying the invention combined with weighing and filling mechanism. Fig. 2 is a detail elevation of part of the mechanism for carrying the packages and the driving mechanism for operating the squeezing and settling mechanism. Fig. 3 is a plan in detail of the stop-and-start mechanism. Fig. 4 is an elevation in detail of the clutch. Fig. 5 is an elevation showing the gripping-fingers and cam and reciprocating shaft which oper-

ate them. Fig. 6 is a detail plan showing the grippers in engagement with a package. Fig. 7 is an elevation showing the gripping-fingers in a different position just before gripping the package and the mechanism for raising and dropping the package. Fig. 8 is a detail showing how the gripping-fingers are given a motion toward each other after they grip the package.

The weighing and filling mechanism represented in the drawings is of the so-called "double-hopper" type, in which goods are supplied to each receptacle through both hoppers in succession. The package receives its first supply from the hopper 1. Thence it is carried along the track 3 by intermittent movements to the hopper 2, where it receives a further supply of goods. It is immaterial to the present invention how the packages are carried to or from the hoppers, the object of the invention being to give the shaking and squeezing to the partially-filled packages at some point between the two hoppers. In the machine shown in the drawings the packages are moved along the track 3 by carrier-fingers (not shown) projecting from the intermittently-moving gear-ring 4, the ring being moved after a package is filled to bring another package under each hopper and remaining stationary while the feeding to the package is in progress. The empty packages are placed on the traveling belt 5, which delivers them one at a time to the sliding carriage 6, the guard 7 at the end of the track on the side of the carriage opposite the belt preventing but one package at a time from being placed on the carriage. A pinion 8, which engages with carrier-ring 4, makes one revolution during each period of movement of the carrier-ring, and thereby through connecting mechanism reciprocates the carriage forward and back once, the package being engaged by one of the carrier-fingers and removed onto the track when the carriage is in its forward position, a guard 9 moving forward with the carriage to prevent another package from being pushed forward from the belt 5 until the return of the carriage into position to receive it. The distance between the two hoppers and the distance through

which the carrier-ring rotates at each period of movement should be so determined that there will be at least one interval of rest after the package has received its partial load before it reaches the hopper where it is to receive the completion of its load.

The mechanism for driving the gripping and shaking mechanism will now be described.

Mounted on shaft 10, which is journaled in bearing 11, fixed to the frame and driven by pulley 12, is a spiral gear 13, which engages with spiral gear 14 on the sleeve 15 and continuously rotates said sleeve 15. A ratchet-wheel 16 is also fast on said sleeve 15. Sleeve 15 is mounted loosely on shaft 17, which is journaled at one end in a bearing 18, carried by a bracket 19, fixed to the frame, and journaled at the other end in a bearing which is supported by column 20.

Fast to shaft 17 is a disk 21, to the face of which is pivoted a dog 22, adapted to be held in engagement with ratchet 16 by a spring 23. When the dog is engaged with ratchet 16, shaft 17 will revolve and actuate the gripping and shaking mechanism, which will be hereinafter described. When then the dog 22 is tripped out of engagement with the ratchet 16, the shaft 17 will cease to revolve and the gripping and shaking mechanism will be inactive. It is necessary that the shaking shall occur while the carrier-ring is at rest and cease while the carrier is in motion. The mechanism for throwing the dog into and out of engagement with the ratchet will now be described.

Pivoted to a fixed part of the machine is a bell-crank lever 24. A spring 25 tends to hold the bell-crank in a position where one arm will engage the tail of the dog 22 and hold the dog out of engagement with the ratchet, as shown in Fig. 3. Pinned to the sliding carriage 6 by a stud 26 is a rod 27, having a finger 28, adapted to engage the outwardly-extending arm of bell-crank 24. Finger 28 has a slip-catch 73 on the end to engage lever 24, so that after throwing it it will slip by and give arm 24 a chance to spring back in position to engage dog 22. Rod 27 is pivoted to one end of rod 29, the other end of rod 29 being pivoted to shaft 30. Shaft 30 is actuated by pinion 8 through suitable connections, as pinion-shaft 34, crank 33, connecting-rod 32, and lever 31. When the carrier-ring begins to move and the carriage 6 moves forward, rod 27 and finger 28 will move with it, and on the return of carriage 6 finger 28 will engage lever 24, throwing it out of engagement with dog 22, and permit the ratchet to be engaged by the dog and shaft 17 to be rotated. Finger 28 has a spring-catch 73, which after engaging lever 24 and moving it a short distance will slip by, and the spring 25 will throw the lever 24 into position to engage dog 22 on the completion of its revolution.

One set of mechanism is provided for shaking the partially-filled package up and down,

and another set is provided for gripping and squeezing the package, both, however, working jointly. The shaking mechanism will now be described.

Fulcrumed on a stud 35, projecting from an arm 36, is a lever 37, having at one end an elongated slot 38, which is engaged by a stud 39, projecting from a vertical plunger 40, which moves up and down inside of column 41, said column having a vertical slot in which the stud 39 moves to permit the vertical movement of plunger 40. Column 41 is directly beneath the track 3, and the plunger 40 moves up between the rails of the track. On the top of plunger 40 is carried a platen 42, which when the plunger 40 is in its downward position, as it will be when the carrier is moving, will lie on a level with the track. When the carrier stops, one of the partially-filled packages will be left standing on the platen 42. Side rails 72, rising from the platen, guard the package against falling off. Mounted on shaft 17 is a cam 43, which engages with a roller on the end of lever 37. The plunger 40 will be gradually raised and suddenly dropped twice during each rotation of the cam when the points of the cam pass the roller 69 on the end of lever 37, as will be obvious from the drawings. The package which stands on the platen 42 will thereby be carried up and down by the same motion as the plunger. A reciprocating rod or shaft 44 is supported at one end by passing loosely through a sleeve or boss 45, projecting from the column 41, the other end of the rod 44 having attached thereto an extension plate or yoke 46, having an elongated slot 47, through which passes the shaft 17. Mounted on shaft 17 is a cam 48, which engages with a roller 51, projecting from the end of the extension-piece 46 of rod 44 and reciprocates the rod 44, the cam being constantly kept in contact with the roller by a spring 52.

Journaled in the bearings 53, Fig. 6, projecting from plate 42, is a rocker-shaft 54, having squared portions 55, which are straddled by the forked ends 56 of the angle-arms 57. Each of these angle-arms is pivoted to the rocker-shaft 54 by a pin 58 at right angles to the rocker-shaft, with a clearance between the upper faces of the squared portions and the crowns of the forks, so that the angle-arms not only rock with the shaft, but also may have a rocking movement on the pins 58 at right angles to the rocking movement of said shaft. A lever 59, fast to shaft 54, extends down between forked ends of block 60, having a swivel-joint connection 70 with reciprocating rod 44, or with a joint 61, which unites two sections of said rod 44. Reciprocation of rod 44 therefore rocks the angle-arms 57 forward and back with a variable movement occasioned by the cam 48.

Projecting from the forked lower ends of the angle-arms 57 are bosses 62, from which pins 63 extend laterally toward each other, as shown in Fig. 6. Mounted in screw-threaded

holes in brackets 64, extending laterally from the bearings 53, are screw-guides 65, which may be adjusted vertically. These screw-guides are engaged by the pins 63, projecting from the angle-arms 57, when the angle-arms are turned crosswise of the path of the package, and cause the angle-arms to also tip toward each other and grip or squeeze the package 71, which is between them, as shown in plan view in Fig. 6. The angle-arms are preferably provided with ears 66, hinged thereto, having convex faces to form the bearing-surfaces on the package. When the rod 44 is moved in a direction to rock shaft 54 in a direction to turn the angle-arms 57 backward, the pins 63 are carried down out of engagement with guide-screws 65, and the springs 67 turn the angle-arms on the pivots 58 and release the pressure on the package. By adjusting the screw-guides 65 the extent of movement of the angle-arms on pivots 58 can be varied. The cams 43 and 48 may be so formed and mounted with relation to each other that the squeezing of the package by the angle-arms shall occur at any position of the package desired and also to have one, two, or more up-and-down movements and squeezings. The preferred practice, however, is to so construct and adjust the mechanisms that the package will be lifted and dropped twice and squeezed twice and that the squeezing shall occur while the package is at the upper end of its stroke. After the first lift the arms slightly withdraw, while the plunger and package descend, then grip the package again in the next rise. Then on the second descent of the plunger the arms draw entirely back. The squeezing tends to crowd the goods into the middle of the package, and the dropping tends to shake them down. The sudden falling off of the points of the cam 43 causes the plunger to drop so suddenly that the package is given a thorough jar when the platen 42, on which the package rests, strikes its seat.

What I claim is—

1. In a packaging-machine, mechanism for partially filling the package, a support for the package which holds the package stationary and free from agitation during the process of filling, mechanism for suspending the supply after the package is partially filled, mechanism for settling the material in the partially-filled package after the supply is suspended, and mechanism which gives an additional supply of material to the package after the settling, substantially as described.

2. In a packaging-machine, mechanism for partially filling the package, mechanism for suspending the supply after the package is partially filled, mechanism for squeezing the sides of the partially-filled package and mechanism for lifting and dropping the package alternately with the squeezing, and mechanism which after the squeezing and shaking supplies additional material to the package, substantially as described.

3. In a packaging-machine, mechanism for

partially filling the package, a support for the package which holds the package stationary and free from agitation during the process of filling, mechanism for removing the partially-filled package and placing another package in position to be partially filled, mechanism for settling the material in the partially-filled package while the succeeding one is receiving its partial load, and mechanism which removes the settled package to another feed and mechanism which furnishes to the settled package an additional supply while one following it is being settled and still another is receiving a partial load, substantially as described.

4. In a packaging-machine, mechanism for partially filling the package, mechanism for suspending the supply after the package is partially filled, mechanism for squeezing the sides of the partially-filled package, and mechanism for supplying additional material to the package after the squeezing, substantially as described.

5. In a packaging-machine, a plurality of feeds, a support for the package which holds it stationary and without agitation during the feeding operation, mechanism for carrying each package to positions to successively receive goods from each feed, and mechanism for settling the goods in the package after the package receives its supply from the first feed and before it receives its supply from the last feed, substantially as described.

6. In a packaging-machine, a plurality of feeding mechanisms, mechanism which places each package in position for each feed in succession, a support for the package which holds it stationary and without agitation during the feeding operation, a vertically-reciprocating member on which the package is deposited after being partially filled before it receives the completion of its supply, and mechanism for vertically reciprocating said member and giving a vertical vibratory movement to the package, substantially as described.

7. In a packaging-machine, two feed mechanisms, intermittent package-moving mechanism which deposits each package under each feed in succession with a rest in its passage from the first feed position to the second feed position, a vertically-reciprocable member upon which the package is deposited by said intermediate movement, mechanism which raises the reciprocable member and package and abruptly drops them onto a seat, and mechanism which squeezes the package alternately with the vertical movement.

8. In a packaging-machine, two feed mechanisms, a package-carrier, mechanism which actuates the carrier to place a package in position to receive material from the first feed, a support for the package which holds the package stationary and free from agitation during the feeding operation, mechanism which actuates the carrier to move the package away from the feed position and brings another package into feed position, mechan-

ism which stops the carrier, mechanism which settles the material in the removed package while the carrier is at rest and while the following package is receiving material, and
 5 mechanism which actuates the carrier to transfer the package from the position where it is settled to the second feed mechanism, and mechanism which causes the package to receive an additional supply from the second
 10 feed, substantially as described.

9. In a packaging-machine, mechanism for supplying material to a package, mechanism for cutting off the feed, mechanism for shaking the package and mechanism for squeezing
 15 ing it alternately with the shaking a plurality of times, and mechanism for supplying an additional amount of material to the package after the shaking and squeezing, substantially as described.

20 10. In a packaging-machine, mechanism for squeezing a partially-filled package comprising a pair of pivoted gripping-arms, mechanism which rocks said arms so as to bring them on opposite sides of the package, mechanism
 25 which then rocks said arms toward each other to squeeze the package, and mechanism which releases the gripping-arms from the package, substantially as described.

11. In a packaging-machine, mechanism for
 30 squeezing a partially-filled package comprising gripping-arms pivoted so as to be capable of turning on two axes at right angles to each other, hinged ears on the inner faces of said arms, mechanism which rocks the arms on
 35 their pivots so as to squeeze the package, and mechanism which releases the gripper from the package, substantially as described.

12. In a packaging-machine, mechanism for
 40 partially filling the package, while at rest, a support which holds the package stationary and free from agitation during the feeding

operation, mechanism for settling the material in the package when partially filled, mechanism for completing the supply to the package and means which cause said filling and
 45 settling mechanisms to perform their operations synchronously on different packages and successively on the same package in the order specified, substantially as described.

13. In a packaging-machine, mechanism for
 50 partially filling a package, a support which holds the package stationary and free from agitation during the process of filling, mechanism for completing the supply to said package, mechanism for transferring the partially-
 55 filled package from the partial supply mechanism to the final supply mechanism, mechanism for stopping the package at a point between the two supply mechanisms, mechanism for agitating said package at said stop-
 60 ping-point, and means which cause the filling and settling mechanisms to operate on different packages while the transferring mechanism is at rest, substantially as described.
 65

14. In a packaging-machine, mechanism for
 partially filling a package, mechanism for transferring the package to a point where it receives a further supply, mechanism for giving
 70 to the package said further supply, mechanism which grasps and agitates said package at a point between said supply mechanisms, and means for moving said package-grasping mechanism into and out of the path of movement of said package, substantially
 75 as described.

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

WILLIAM H. DOBLE.

Witnesses:

WILLIAM A. COPELAND,
 MINNIE L. WRISLEY