

No. 767,394.

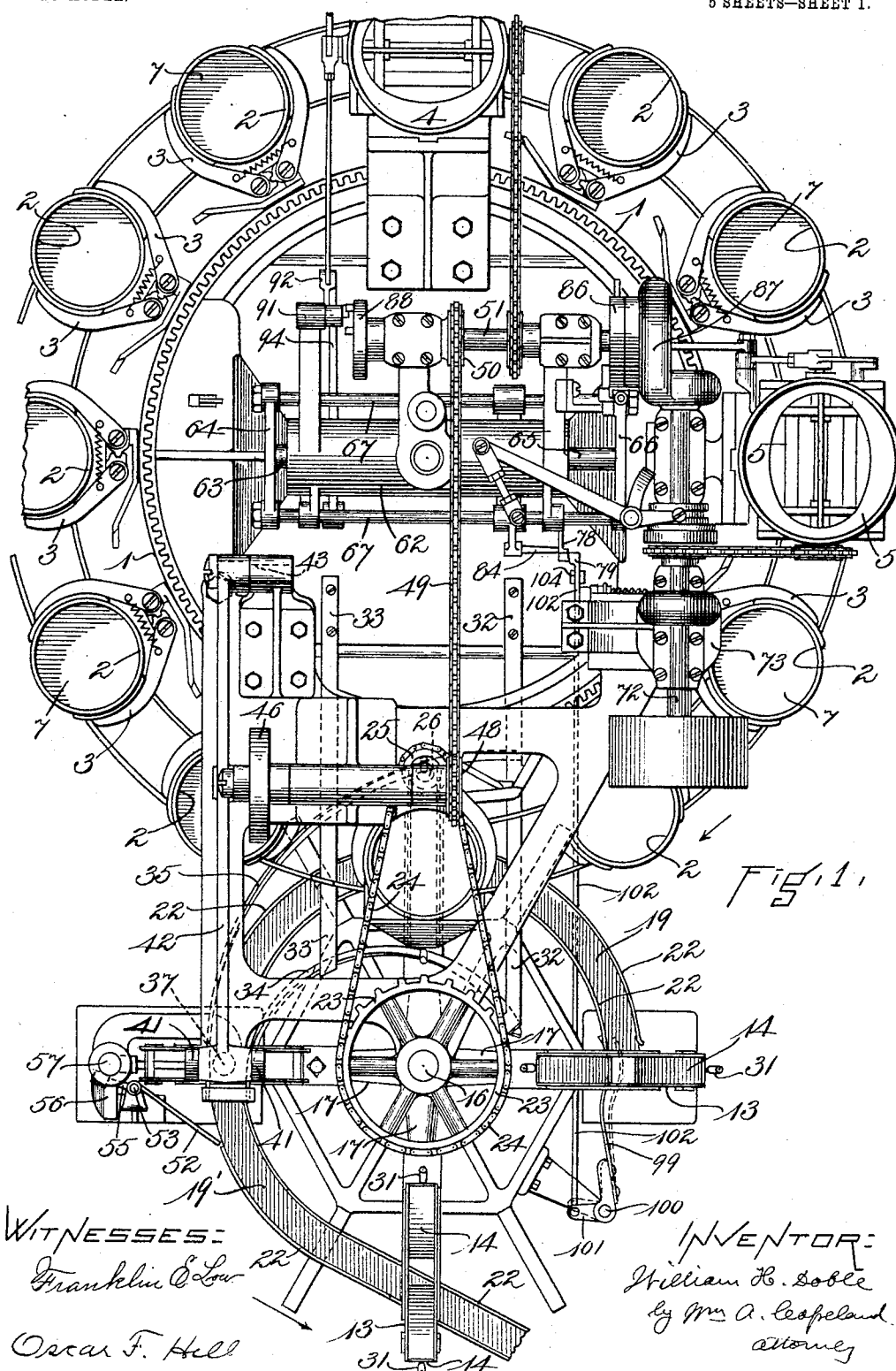
PATENTED AUG. 16, 1904.

W. H. DOBLE.
WEIGHING AND FILLING MACHINE.

APPLICATION FILED JAN. 4, 1904.

NO MODEL.

5 SHEETS—SHEET 1.



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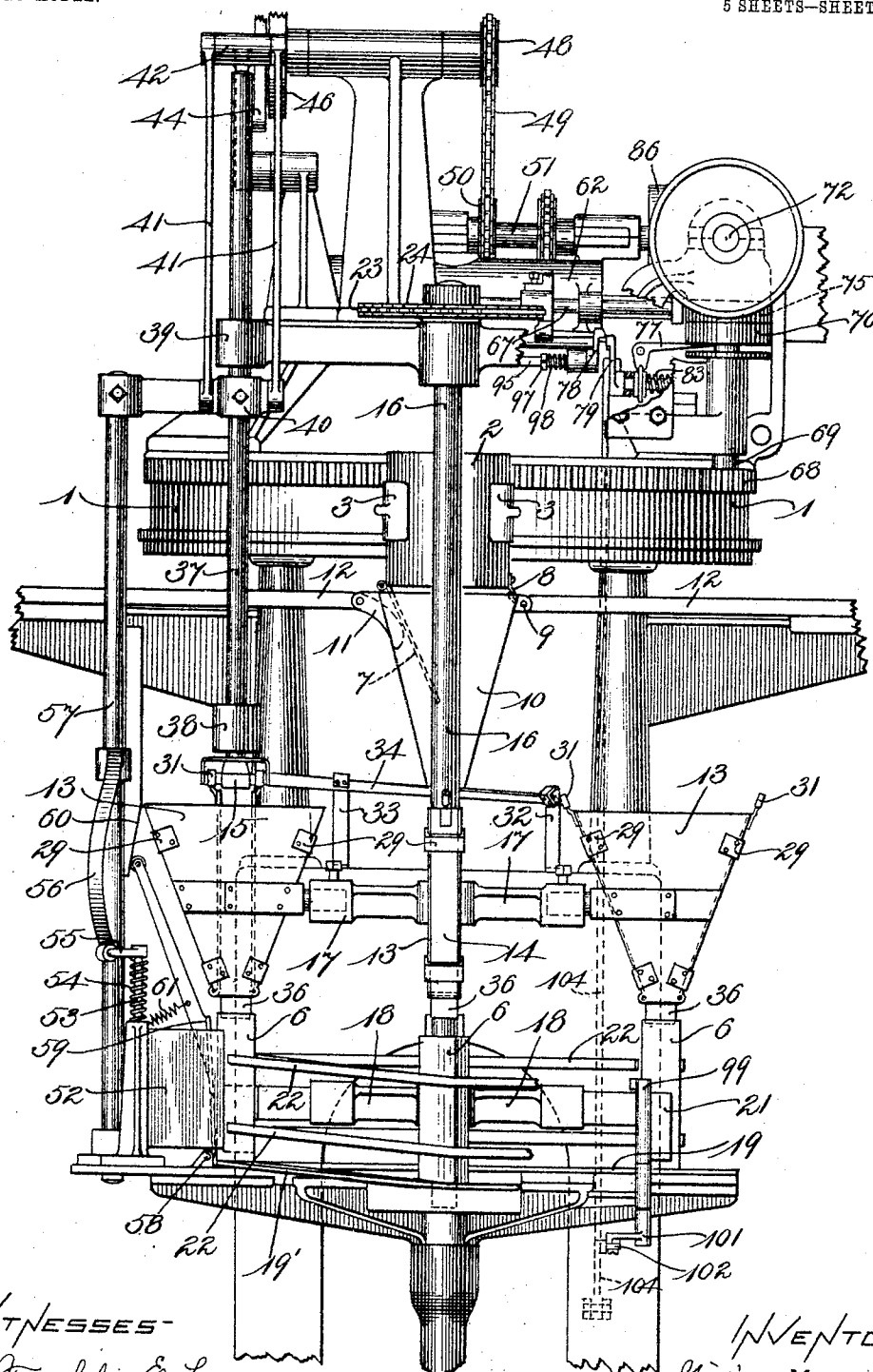
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5 SHEETS—SHEET 2.



WITNESSES—

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FIG. 2.

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5 SHEETS—SHEET 3.

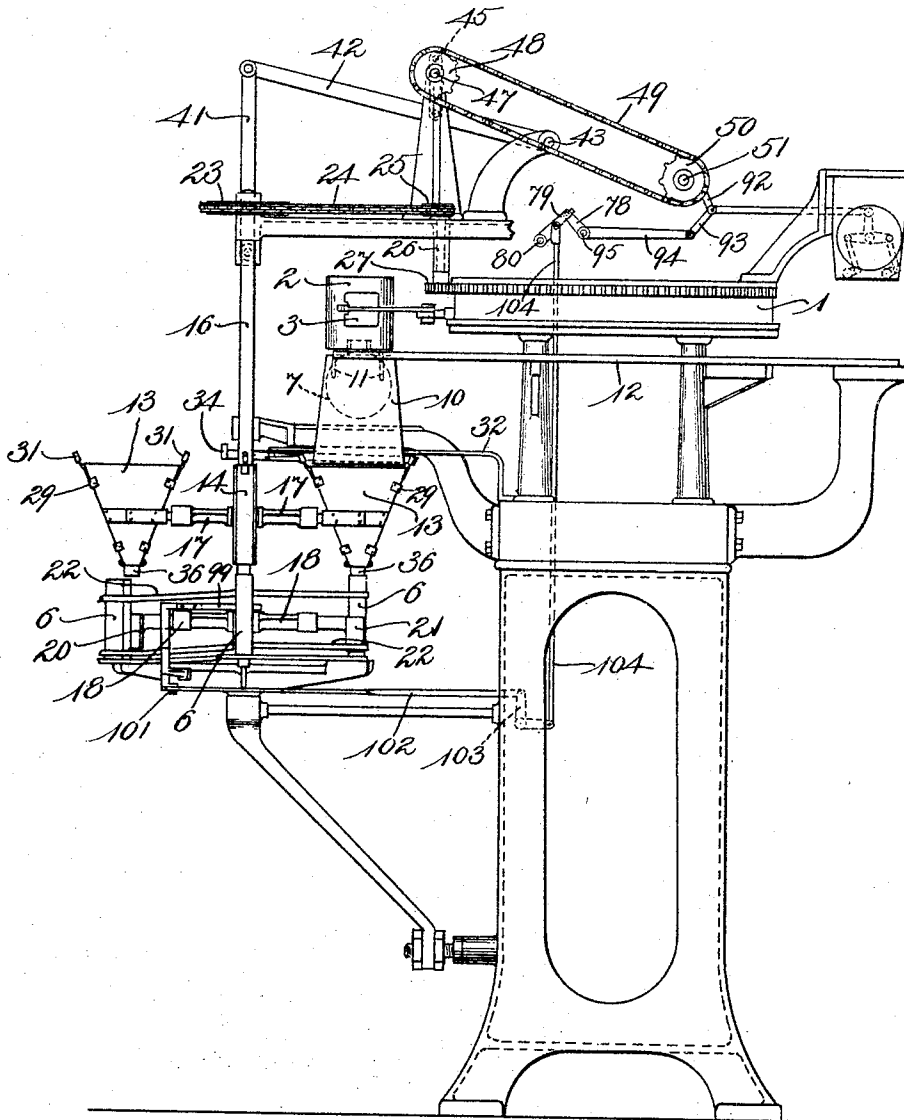


Fig. 3.

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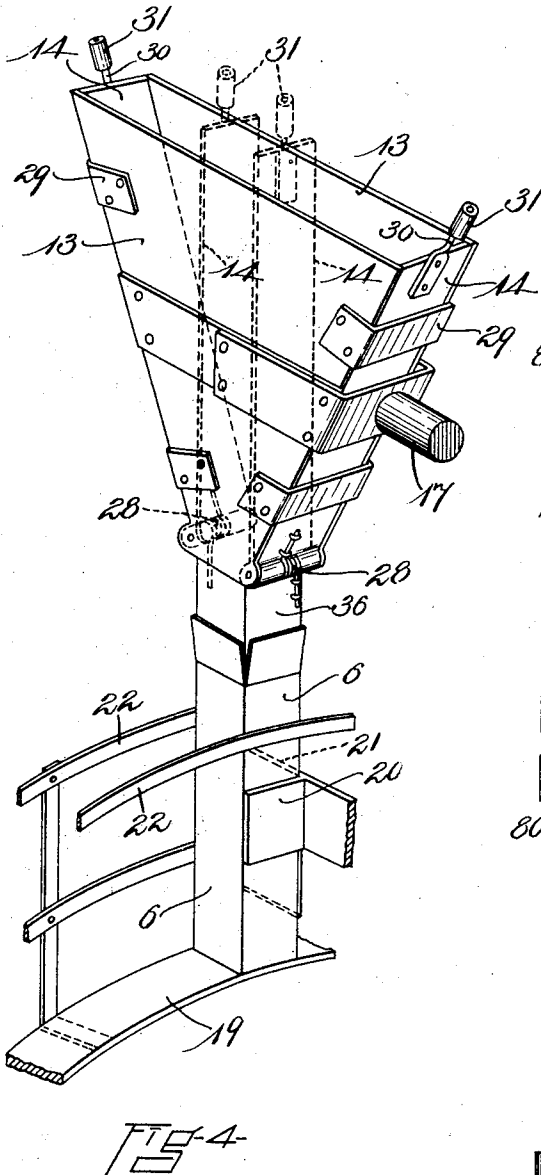
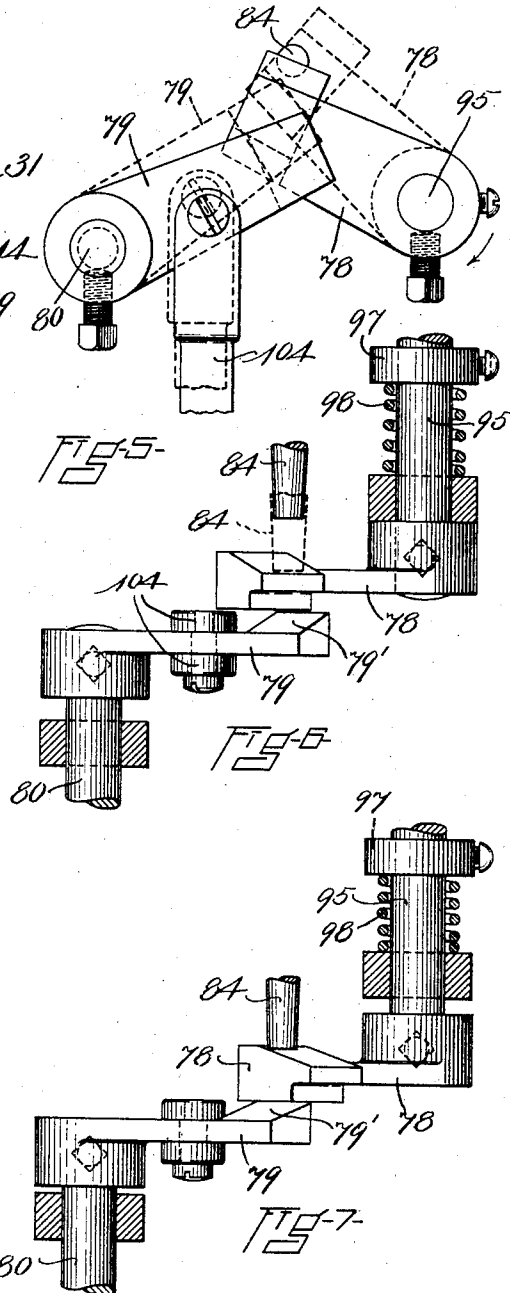
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6 SHEETS—SHEET 4.



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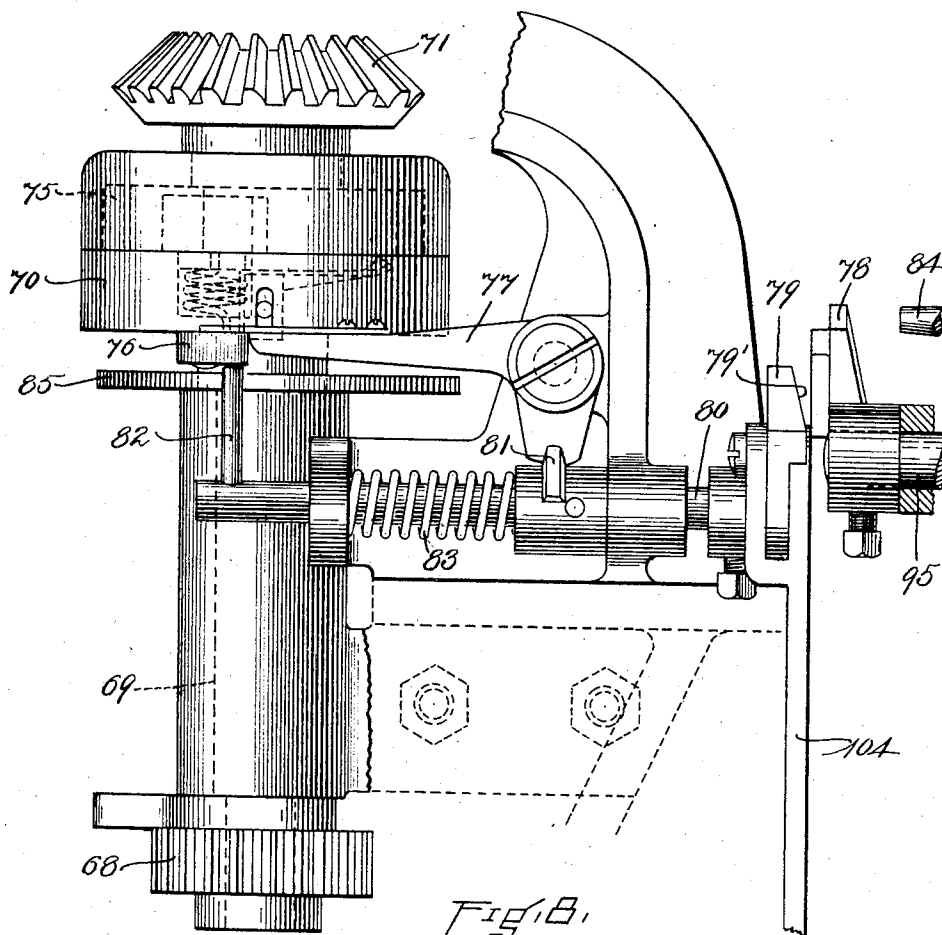
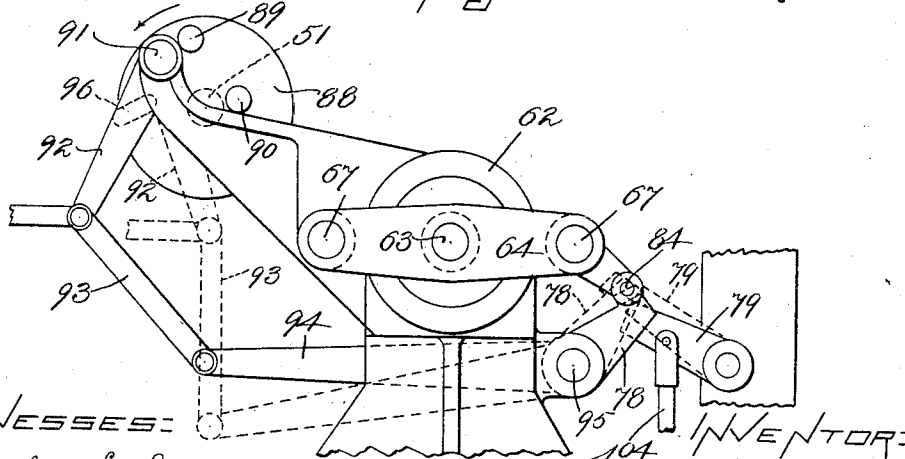
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NO MODEL.

5 SHEETS--SHEET 5.



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UNITED STATES PATENT OFFICE.

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

WEIGHING AND FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 767,394, dated August 16, 1904.

Application filed January 4, 1904. Serial No. 187,628. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. DOBLE, of Quincy, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Weighing and Filling Machines, of which the following is a specification.

The object of the present invention is to provide a machine for weighing and filling into packages goods which are light and bulky and where the space which they occupy when in bulk is greatly in excess of the space required when they are compressed—such goods, for instance, as tea and other herbs.

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. Fig. 2 is a partial side elevation, broken away, looking up from the bottom of Fig. 1. Fig. 3 is a partial front elevation, on a reduced scale, looking from the right of Fig. 1, showing the method of driving the auxiliary spider by connection with the carrier-ring. Fig. 4 is an enlarged perspective view of the collapsible funnel. Fig. 5 is a front elevation of the wedge-levers for throwing the clutch, showing them dotted in the upward position. Fig. 6 is a plan view of the wedge-levers in their lower or full-line position of Fig. 5. Fig. 7 is a plan view of the wedge-levers in their upper or dotted position in Fig. 5. Fig. 8 is an enlarged side elevation, full size, of the clutch looking from the top of sheet 1, showing the wedge-levers in their downward position and the clutch out of engagement. Fig. 9 is a diagrammatic end elevation of the air-cylinder of a pneumatic weighing-machine looking from the left of Fig. 1, showing the method of rocking the shafts which move the wedge-levers into position for the push-rod to move forward and engage them to throw the clutch into operative engagement with the driving mechanism.

In the form of machine shown in the draw-

ings the goods are first automatically weighed and dumped into temporary receptacles, which for convenience of brief designation are termed "buckets." The buckets containing the weighed material are moved to a place of discharge, where the material is automatically discharged into the cartons or other receptacles in which the material is to be packed. For convenience of brief designation these permanent receptacles will herein be referred to as "cartons;" but that term is intended to be taken broadly as including any kind of receptacle in which the material can be packed by the mechanism of the invention.

The mechanism shown for weighing and dumping the material into the buckets and discharging the material from the buckets is similar to that shown in Patent No. 720,008, dated February 10, 1903, granted to the Pneumatic Scale Corporation as assignee of William H. Doble, and therefore is not herein described in detail.

Briefly, 1 represents the carrier-ring, which is given an intermittent rotary movement through mechanism actuated by the tipping of the scale.

The buckets 2 are held by the bucket-clamps 3, attached to the ring 1, and carried around during the rotation of the ring first to the preliminary feed-hopper 4, if a two-hopper machine be used, thence to the scale-hopper 5, where the requisite amount for making up the balance of the load is fed to the bucket, thence to the place of discharge into the carton 6, as shown in Figs. 2 and 3.

The buckets 2 are provided with a hinged bottom 7, normally kept closed by a spring-latch 8, which is tripped by a stud 9 when the bucket arrives at the discharge position over the stationary discharge-chute 10, as shown in Fig. 2. When the carrier-ring moves again after the discharge, the hinged bottom 7 is closed by trailing over the inclined ends 11 of the rails 12. The material passes through the discharge-chute 10 into the receiving-funnels 13, which are successively brought around to a position to receive the material as it is discharged from the chute 10.

The receiving-funnels 13 are provided with two opposite side walls 14 14, movable toward each other, and mechanism is provided by which after the material has been received into the said funnels the two movable sides 14 14 are brought toward each other, thereby compressing the material into such shape that a plunger 15, which then pushes down upon the top of the compressed mass, forces it bodily into the carton 6 and further compresses it, as will be more fully described.

The receiving-funnels and cartons are moved around intermittently in unison with the movement of the carrier-ring 1 by driving mechanism actuated by the carrier-ring 1. The means by which this synchronous movement is effected is as follows: Mounted on a vertical rotary shaft 16 are radiating arms 17, having attached to their outer ends the funnels 13. Mounted on said shaft 16 below the arms 17 are radiating arms 18, which are provided at their outer ends with plates 20 21, which engage two adjacent sides of the cartons and push the cartons around on the track 19. Guide-rails 22 are provided, which are sufficiently close together so that the cartons will fit closely between them, and the friction of the two rails upon the cartons will prevent the cartons from tipping forward. On the upper end of the vertical shaft 16 is a sprocket-wheel 23, driven by a chain 24, which connects sprocket-wheel 23 with sprocket-wheel 25 on shaft 26. On the lower end of shaft 26 is a pinion 27, which meshes with the carrier-ring 1, so that the carrier-ring 1, through the intermediate mechanism above described, actuates the vertical shaft 16 and the arms 17 and 18, carried by said shaft. It is obvious that the particular form of intermediate mechanism by which the carrier-ring 1 drives the shaft 16 may be varied and come within the scope of this invention.

The receiving-funnels 13, as already stated, are formed with two opposite sides adapted to be moved toward each other to compress the material before it is forced into the carton. The preferred form of construction is as follows: The two fixed sides of the funnel are formed widest at the top and taper from the top toward the bottom, where they are narrowed down to about the width of the carton which is intended to be used with the machine. The two movable sides 14 14 are hinged at their lower ends to the lower ends of the fixed sides and are of such width that when turned on their hinges they may move between the two fixed sides. They are provided with springs 28, which normally hold the sides 14 in their most widely-separated position and bring them back to this position when they are released after having been brought toward each other. The frame-plates 29 prevent the movable sides 14 from spreading beyond the limits of the fixed sides. On the

upper ends of the swinging sides 14 are secured the two studs 30 30, extending above the top of the funnel and carrying on their upper ends rollers 31 31. Fastened to the supporting-bars 32 33 are two curved rails 34 35, between and against which the rollers 31 move during a portion of the movement of the funnels 13. The rails 34 35 are arranged to converge toward each other in the direction of movement of the funnels, so that during the movement of the funnels from their position under the discharge-chute 10 to the position where the material is to be forced from the funnel into the carton the engagement of the rollers 31 31 with the rails 34 35 will cause the sides 14 14 to swing toward each other on their hinges into a position where they are parallel with each other, as shown in dotted lines in Fig. 4. This will compress the material into a rectangular mass of approximately the same form and size in cross-section as the cross-section of the carton.

On the lower end of each funnel 13 is a nozzle 36, over which is slipped the upper end of the carton to be filled. The pressure device for forcing the compressed material out of the receiving-funnel into the carton is located in vertical alinement with the central line of the funnel and the carton when they are in one of the positions of rest in the rotation of the carrier after the funnel has reached the narrowest space between the rails 34 35 and before it has passed out from engagement with said rails.

The pressure device and its actuating mechanism shown are as follows: The face of the plunger 15 is formed in size and shape to easily go into the carton. The plunger is carried on the lower end of a vertically-reciprocating rod 37, which moves in suitable bearings, as 38 39. Secured to the rod 37 is a cross-head 40, which is connected by rods 41 41 with a lever 42, fulcrumed at 43 upon a fixed part of the frame. Lever 42 is connected by rod 44 with a crank-pin 45 on crank-disk 46. Crank-disk 46 is mounted on shaft 47, on which is also a sprocket-wheel 48. Sprocket 48 is connected by a chain 49 with sprocket 50 on shaft 51, which is intermittently driven by a shaft 72 and intermediate mechanism actuated by the backward movement of the reciprocating frame in such manner as to be set in operation just after the carrier-ring comes to a rest, so that the plunger 15 will operate when the carton is at rest. Shaft 51 will be referred to as the "secondary" shaft. While the material is being forced into the carton, it being already under compression by the swinging sides 14 and having a tendency to expand in all directions, it is necessary to have the walls of the carton supported externally on all sides in order to prevent bursting of the carton. On the rear side and on the radially inner side it is supported

by the plates 20 21, as already described. (See Fig. 4.)

It is necessary that the means for supporting the carton on the advance side should be withdrawn while the carton is in motion in order not to obstruct the movement of the carton. The means provided and shown is as follows: A supporting-plate 52 is secured to a vertical rock-shaft 53, which is located on the outer side of the circular path of movement of the carton in such position that by turning the rock-shaft the supporting-plate may be swung around in front of the advance side of the carton. A spring 54 normally holds the plate 52 outside of the path of the carton. Secured to the upper end of the rock-shaft 53 is a lever 55, having on its outer end a roll which engages with a cam 56, carried by a vertically-reciprocating rod 57. Said rod 57 is rigidly connected at its upper end with cross-head 40, so that cam 57 moves up and down at the same time with plunger 15. When the cam 57 descends, it turns the rock-shaft 53 against the pressure of spring 54 and swings the plate 52 around across the path of movement of the carton into position to support the advance side of the carton. When the cam 56 rises, the spring 54 causes the plate 52 to swing back out of the path of the carton.

It is desirable that the support for the radially outer side of the carton should also be withdrawn from contact with the carton before the carton moves after being filled. The means shown for thus supporting and withdrawing is as follows: Pivoted at 58 outside of the path of movement of the carton is a supporting-plate 59, carrying at its upper end a roll which engages with a cam 60, carried by rod 57. When rod 57 descends, the cam 60 turns the plate 59 into position to support the outer side of the carton. When the rod 57 rises, a spring 61 pulls the plate back on its pivot out of engagement with the carton. The guard-rails 22 are formed with a gap to permit movement of the supporting-plates 52 and 59.

After the carton has been filled it is important that as it is moved farther around in order to be removed from the machine it should be lowered out of engagement with the nozzle of the funnel 13. The means shown by which this is accomplished is to form the track 19 with a declining portion 19'. From the foot of the decline the track extends tangentially, and the filled cartons are guided out beyond the range of the plate 21 and thence removed in any suitable way.

As the auxiliary spider which carries the cartons and receiving-funnels is driven by connection with the carrier-ring 1 and in unison with it, it is important that the machine should not begin to move again after the completion of a cycle of movement unless there is a carton in proper position in engagement

with the funnel beneath the discharge-chute 65 and one beneath the plunger to receive the material when it is forced out of the receiving-funnel by the plunger.

In the machine shown the cartons are brought into engagement with the nozzles of the receiving-funnels by hand at some one of its stopping-points in the travel before the funnel reaches the discharge-chute. In order to insure a carton always being in position to receive the material, the starting of the machine for a new cycle of movement is controlled by the operator in placing a carton into engagement with the funnel. The mechanism shown by which this is accomplished is as follows: The feed-valve opening and closing mechanism for the scale-hopper 5 may consist of any suitable means whereby the feed-valve is opened after the weighing-bucket has reached the scale and which closes the feed-valve after the required load has been fed into the bucket. The preferred form is a reciprocating member connected with the feed-valve and driven by any suitable power, which is applied by mechanism actuated by the tipping of the scale to move the reciprocating member in direction to close the valve and mechanism which applies the power to move the reciprocating member in the reverse direction and open the valve when a bucket again reaches the scale. Methods for doing this are well known, one method being by means of a solenoid, as shown in Patent No. 633,675, dated September 26, 1899, on application of G. W. Watson, and another method is by compressed air, as shown in Patent No. 720,008, dated February 10, 1903, on application of W. H. Doble. The means shown in the drawings is compressed air operated by mechanism similar to that shown in Patent No. 720,008 and will be herein but briefly described. In one end of a double cylinder 62 is a piston (not shown) whose stem 63 is connected with the cross-head 64, and in the other end of the cylinder is a piston whose stem 65 is connected with cross-head 66. The two cross-heads are connected by rods 67, which are supported by and slide through brackets fixed to the side of the cylinder 62. The two cross-heads and connecting-rods will be referred to as the "reciprocating frame." These pistons are in two cylinders placed end to end, both together being designated as "cylinder 62," their outer ends being open. Between the two pistons and controlling the admission of air to actuate either piston is an air-valve which actuates the pistons to reciprocate the frame to move in a direction to alternately open and close the scale-valve. When the scale tips, the reciprocating frame moves in a direction to close the scale-valve. The ring 1, as already stated, has an intermittent motion, it being given at each cycle of operation a movement through an arc equal

to that between two of the buckets. The carrier-ring 1 is driven by pinion 68 on shaft 69, and shaft 69 is connected by a clutch 70 and bevel-gear 71 with a bevel-gear on shaft 72, said gear being inclosed in a casing 73. The lower member of clutch 70 is fast to shaft 69, and the upper member is fast to the hub of bevel-gear 71, but loose on shaft 69. In the inner periphery of the upper member of clutch 70 are a series of scalloped recesses 75, adapted to be engaged by a pawl pivoted to the lower member. A spring tends to normally hold the pawl thus engaged. Attached to the pawl-shaft is a dog 76, which when the reciprocating frame is in its rearward position and the scale-valve is open is engaged by a stop-lever 77 in a manner to hold the pawl out of engagement with the upper shell of the clutch 72. When the reciprocating frame moves forward to close the hopper-valve, the thrust-rod 84, fixed to the side of the reciprocating frame, will by its engagement with wedge-arm 78 and the engagement of arm 78 with arm 79 push the sliding pin 80 to the left as viewed in Fig. 8, thereby causing the toothed collar 81 on sliding pin 80, which is in engagement with stop-lever 77, to turn lever 77 on its pivot and disengage the stop-lever from the dog 76 and permitting the pawl within the clutch to be thrown by its spring to lock the two members of the clutch together. The clutch is fully shown and described in Patent No. 720,008, already mentioned. When the two members of the clutch are locked together, the pinion 68 is caused to rotate and turn the ring 1. Carried on shaft 69 is an eccentric cam 85, which when said shaft has partially completed a revolution will by its engagement with arm 82, projecting from sliding pin 80, turn said pin 80 on its axis far enough to turn arm 79 down out of engagement with wedge-arm 78, and a spring 83, which was compressed when the pin 80 was pushed by the sliding frame, will expand and push said pin 80 in the reverse direction back into the position shown in Fig. 8, bringing stop-lever 77 down into position to again intercept dog 76 at the end of the revolution of shaft 69. When the dog 76 is thus intercepted, the two members of the clutch will be disengaged and the rotation of pinion 68 and carrier-ring 1 will be stopped, the pinion 68 having made one complete revolution. Before the clutch 70 has completed its revolution the cam 85 by its engagement with arm 82 will have turned sliding pin 80 on its axis and moved the wedge-face of arm 79 far enough in relation to the wedge-face of arm 78 to permit the spring 83 to move sliding pin 80 to the right in Fig. 8 and cause stop-finger 77 to drop into position to intercept the dog 76, and thus throw the clutch 70 out of engagement.

As already stated, the secondary shaft 51,

which drives the plunger 15, makes one revolution at each cycle of movement of the machine, and this movement occurs while the carrier-ring and the carton-moving head are at rest. Mechanism for doing this is shown in the drawings and is similar to mechanism shown in Patent No. 720,008, already referred to, for rotating a secondary shaft while the carrier-ring is at rest. Briefly described, it is as follows: Fast to shaft 51 is one member of a clutch 86, (see Figs. 1 and 2,) the other member being loose on said shaft. Said clutch is similar to clutch 70, already described. The loose member of the clutch is driven by a bevel-gear inclosed in casing 87, the driving member of the bevel-gear being fast to driving-shaft 72. Upon the completion of a movement of the carrier-ring 1 the air-valves are actuated to cause the pistons to move in a rearward direction and open the scale-valve of hopper 5. At the same time the two members of the clutch 86 are caused to engage each other and turn the shaft 51. On shaft 51 is a disk 88, projecting from the face of which are two studs 89 and 90 at different distances from the center of the disk. Pivoted at 91 to a fixed part of the frame is a lever 92, which is connected by a link 93 with a lever 94. Lever 94 is fixed to rock-shaft 95. Projecting from lever 92 is a boss 96, which is adapted to be engaged by the studs 89 and 90, projecting from the disk 88, at different periods in the rotation of the disk. The stud 89, which is nearer the periphery of the disk, is adapted to throw the lever 92 in a direction to cause the rock-shaft 95 to turn in one direction, and the continued rotation of the disk will bring the stud 90 into engagement with the boss 96 and turn the shaft 95 in the reverse direction.

In Fig. 5 the dotted lines show the position which wedge-arm 78 assumes when the parts shown in Fig. 9 are in their dotted-line position, and the full lines show the position of wedge-arm 78 when the parts shown in Fig. 9 are in their full-line position.

In Fig. 6 the wedge-arm 78 is shown in plan in the position that it appears in the full-line position of Figs. 5 and 9.

In Fig. 7 the arm 78 shows the position that it occupies when turned up as shown in dotted lines in Fig. 9.

The rocking shaft 95, which carries wedge-arm 78, has a movement lengthwise as well as a rocking movement.

Shaft 95 has a collar 97, (see Fig. 2,) between which and the front bearing of shaft 95 is a spring 98, tending to hold the shaft in a rearward position, as shown in Fig. 2.

In the position of the parts shown in full lines in Fig. 9 both hopper-valves are discharging into their respective buckets, the lever 92 having been thrown by stud 90 into the position shown in said figure. The disk

88 will continue to revolve until stud 89 has passed the position at which it strikes the boss 96 and throws lever 92 into the position shown in dotted lines. Lever 78 will then be turned upwardly, as in dotted lines in Fig. 9 and as shown in full lines in Fig. 7. In this latter position the lever 78 is in the position to be pushed forward by the push-rod 84 when the reciprocating frame to which rod 84 is fixed moves forward upon the tipping of the scale.

As already stated, it is intended that a carton must be in position under the receiving-funnel when the funnel is in its carton-receiving position before the carrier-ring can start. Mechanism whereby the carton controls the starting of the carrier-ring is provided as follows: Journaled in a fixed part of the frame of the auxiliary ring is a shaft 100, carrying at its upper end a finger 99, which projects over the track 19 and is adapted to be engaged by the carton when a carton is placed in position under a receiving-funnel. On the lower end of said shaft 100 is fixed a lever 101, to which is pivoted a connecting-rod 102, the other end of which is connected with the bell-crank lever 103, which in turn is connected with the upright connecting-rod 104. The upper end of rod 104 is pivotally connected with wedge-arm 79. When a carton is placed in position on a funnel, it pushes finger 99 back into the position shown in full lines in Fig. 1 and pushes connecting-rod 102 to the left as viewed in Fig. 3 and pushes rod 104 upward, thereby turning wedge-arm 79 so that its inclined face 79' rides up on the flat face of wedge-arm 78 into the position shown in Fig. 7 and in dotted lines as shown in Fig. 5. If the wedge-arms are in this position when the reciprocating frame moves forward, the rod 84 will engage wedge-arm 78 at its thickest portion, and the thickest part of wedge-arm 79 being in position to engage with wedge-arm 78 the forward movement of rod 84 will move shafts 95 and 80 to the left as viewed in Fig. 8 and lift stop-lever 77 out of engagement with dog 76, thereby allowing the two members of the clutch to become engaged with each other and the shaft 69 to rotate and turn the carrier-ring 1.

As will be seen, there can be no movement of the carrier-ring 1 until the scale has tipped and moved the push-rod 84 forward and the controlling-disk 88 on secondary shaft 51 has completed its movement to bring wedge-arm 78 into its upward position and wedge-arm 79 has also been brought into its upward position by the introduction of a carton. Any one of these movements may take place in advance of the others.

If the carton has been placed in position and the disk 88 has completed its movement before the scale tips, then the wedge-arms 78 and 79 are both already in position, so that as soon as the scale tips and the reciprocating

frame moves forward the rod 84 will engage the thick part of wedge-arm 78 in the manner already described and push rods 95 and 80 forward and cause the carrier-ring 1 to start.

If the disk 88 has completed its movement and the scale tips before a carton has been placed in position, then the shaft 95 will be in its forward position and wedge-arm 78 will be in its forward and upward position; but there can be no movement of the carrier-ring 1 until the introduction of a carton, which will turn said arm 79 up and by the rubbing engagement of the inclined face 79' of wedge-arm 79 on the flat face of wedge-arm 78 will cause the shaft 80 to move forward, wedge-arm 78 and shaft 95 being held by rod 84 against backward movement when the wedge-arm 79 is pushed upward.

If the carton is in position when the scale tips but the disk 88 has not completed its movement, then the wedge-arm 78 will not have its thick portion in position to be engaged by rod 84, and therefore there can be no forward thrust of the shaft 80 and no starting of the carrier-ring 1. When, however, the disk 88 does complete its movement, the wedge-arm 78 will wedge up between the rod 84 and wedge-arm 79, and by reason of the practically fixed position of rod 84 at this time rods 95 and 80 will be pushed forward and the carrier-ring 1 will be started.

The scale will tip and move the reciprocating frame and push-rod 84 forward when the load is completed whether the secondary shaft 51 and disk 88 have completed their movement or not and whether there is a carton on the receiving-funnel or not. The wedge-arm 78 will be moved into its engaging position when the shaft 51 and disk 88 have completed their movement whether the scale has tipped or not and whether there is a carton on the receiving-funnel or not, and the placing of a carton on the receiving-funnel will move wedge-arm 79 up into engaging position whether the scale has tipped and whether the disk and secondary shaft have completed their movement or not—that is, each makes its movement independently of the others; but there can be no movement of the carrier-ring until both wedge-arms and the push-rod have all come into engaging position. The movement of the disk and secondary shaft and the tipping of the scale and movement of the frame, however, are automatic and will take place at certain periods without regard to the operator. The introduction of the carton, however, being done by the operator, he can control the operation to make the carrier start as soon as the disk has completed its movement and the scale has tipped, or he can start it at any time thereafter when he pleases to introduce a carton to the receiving-funnel, and thus run it as slow as he desires or allow it to remain at rest.

What I claim is—

1. In combination with a weighing-machine, a series of weighing-receptacles, an intermittently-moving carrier which moves the weighing-receptacles to and from the scale, a feed-valve which is closed by the tipping of the scale, mechanism for causing the discharge of the material from the weighing-receptacles at a certain point in the path after they have been loaded, a series of funnels, an intermittently-moving carton-receiving funnel-carrier which is actuated by the carrier of the weighing-machine and brings the funnels successively into position to receive the material as it is discharged from the weighing-receptacles, and mechanism controlled by the placing of a carton on the receiving-funnel to start the carrier, substantially as described.

2. In combination with a weighing and package-filling machine, a series of funnels to receive the cartons to be filled, an intermittently-moving funnel-carrier, and mechanism for controlling the starting of the carrier which is actuated by the carton in being placed upon the receiving-funnel, substantially as described.

3. In a package-filling machine a four-sided funnel having two opposite sides flaring in width from the bottom toward the top, the other two sides being pivoted at the bottom between the first pair of sides, and means for normally holding the pivoted sides spread, flaring with relation to each other, and means for turning the said pivoted sides toward each other, substantially as described.

4. In a package-filling machine, a funnel having two opposite sides pivoted at their lower ends, means for normally holding said pivoted sides flaring away from each other between the other sides, means for moving the funnel, and mechanism which engages the pivoted sides during the travel of the funnel and turns them toward each other, substantially as described.

5. In a weighing and package-filling machine, a series of weighing-receptacles; an intermittently-moving carrier which moves the weighing-receptacles to and from the scale, a scale feed-valve, mechanism controlled by the tipping of the scale to close the said valve, mechanism for causing the discharge of the material from the weighing-receptacles at a certain point in their path after they have been loaded, an intermittently-moving carton-carrier provided with a series of carton-receiving funnels, connecting mechanism whereby the carrier of the weighing mechanism actuates the carton and funnel carrier, and brings the funnels and attached cartons successively to a position to receive the material when discharged from the weighing-receptacles, a plunger and operating mechanism therefor controlled by the opening of the scale feed-valve of the weighing mechanism to actuate

the plunger to descend into the funnel and force the material into the carton beneath the funnel, substantially as described.

6. In a weighing and package-filling machine, a series of weighing-receptacles, an intermittently-moving carrier which moves the weighing-receptacles to and from the scale, a feed-valve, mechanism controlled by the tipping of the scale to close the said valve, mechanism for causing the discharge of the material from the weighing-receptacles at a certain point in their path after they have been loaded, an intermittently-moving carrier provided with a series of carton-receiving funnels each having two opposite sides pivoted at their lower ends and normally held flaring away from each other between the other sides, connecting mechanism whereby the carrier of the weighing mechanism actuates the funnel-carrier and brings the funnels successively to a position to receive the material when discharged from the weighing-receptacles, mechanism which turns the pivoted sides toward each other during the movement of the funnel-carrier, and compresses the material in the funnel, a plunger and operating mechanism therefor controlled by the closing of the scale feed-valve of the weighing mechanism to actuate the plunger to descend into the funnel and force the material into the carton, substantially as described.

7. In a weighing and package-filling machine, a series of weighing-receptacles, an intermittently-moving carrier which moves the weighing-receptacles to and from the scale, a feed-valve, mechanism actuated by the tipping of the scale to close said valve and mechanism actuated by the carrier to open said valve, mechanism for causing the discharge of the material from the weighing-receptacles at a certain point in their path after they have been loaded, an intermittently-moving carrier provided with a series of carton-receiving funnels, connecting mechanism whereby the carrier of the weighing mechanism actuates the funnel-carrier and brings the funnels successively to a position to receive the material when discharged from the weighing-receptacles, a plunger and operating mechanism therefor, an intermittently-rotating secondary shaft controlled by the closing of the scale feed-valve to actuate the plunger to descend into the funnel and force the material into the carton, intermittently-operating driving mechanism for the carrier of the weighing mechanism, and mechanism actuated by the opening of the scale-valve, mechanism actuated by the secondary shaft when it has completed a certain movement, and mechanism actuated by the placing of a carton on the receiving-funnel, the combined action of which three mechanisms controls the starting of the carrier of the weighing mechanism, substantially as described.

8. In a carton-filling machine, a funnel constructed to receive a carton on its lower end, a vertically-reciprocating rod carrying a plunger-press, mechanism for moving the plunger
5 down into the funnel, and forcing the material from the funnel into the attached carton, a vertical rock-shaft and a plate mounted thereon at one side of the carton, means whereby the descent of the reciprocating rod and plunger causes the said rock-shaft to turn the plate
10 across the front of the carton and when the said rod rises the plate is turned away from the carton, substantially as described.

9. In a weighing and package-filling machine, a series of weighing-receptacles, an intermittently-moving carrier which moves the weighing-receptacles to and from the scale, a scale feed-valve, mechanisms controlled by the tipping of the scale to close the said valve and the carrier, mechanism controlled by the movement of the carrier to open the said valve, mechanism for causing the discharge of the material from the weighing-receptacles at a certain point in their path after they have
25 been loaded, an intermittently-moving carton-carrier provided with a series of carton-receiving funnels, connecting mechanism whereby the carrier of the weighing mechanism actuates the carton and funnel carrier and brings the funnels and attached cartons successively
30 to a position to receive the material when discharged from the weighing-receptacles, a plunger rod and press, and operating mechanism controlled by the opening of the scale feed-valve to cause the pressure device to descend and force the material from the funnel into the carton and rise again, and movable supports for two sides of the carton and mechanism actuated by the descent of the plunger
40 to move the said supports into position to support the carton while the plunger forces the material into the carton and mechanism which moves the said supports away from the cartons when the plunger rises, substantially as described.

10. In a package-filling machine, an intermittently-rotatable carton-carrier provided with a series of funnels which are carried by said carrier in a path above the path of movement of the cartons, the funnels having two opposite sides movable toward each other between the other pair of opposite sides, means for feeding material into the funnels while in one of their positions of rest, converging
55 guides between which the funnels pass during a portion of their travel after receiving their supply, and which move said movable sides toward each other and compress the material in the funnel laterally, and mechanism
60 which forces the compressed material from the funnel into the carton, substantially as described.

11. In a weighing and package-filling machine, a series of weighing-receptacles, an in-

termittently-rotating carrier which moves the weighing receptacles or buckets to and from the scale, a scale feed-valve, mechanism controlled by the tipping of the scale to close the valve and start the carrier, mechanism controlled by the movement of the carrier to open the valve, mechanism for causing the discharge of the material from the buckets at a certain point in their path after they have been loaded, an intermittently-rotating carton-carrier provided with a series of carton-receiving funnels, connecting mechanism whereby the carrier of the weighing mechanism actuates the carton and funnel carrier and brings the funnels and attached cartons successively to a position to receive the material
80 when discharged from the weighing-receptacles, a plunger rod and press and operating mechanism controlled by the opening of the scale feed-valve to cause the pressure device to descend and force the material from the funnel into the carton and rise again, supports carried by the carton-carrier which engage the rear side and radially inner side of the carton, and movable supports which are actuated by the descent of the plunger to move into position to support the carton on the advance side and radially outer side, and means which move said movable supports out of the way of the carton when the plunger rises, substantially as described.

12. In a weighing and package-filling machine, a series of weighing-receptacles, an intermittently-rotating carrier which moves the weighing-receptacles to and from the scale, a reciprocating member, mechanism actuated thereby which is controlled by the tipping of the scale to close the scale-valve and driving mechanism for the carrier controlled by the closing movement of the reciprocating frame to start the carrier, an intermittently-rotating carton-carrier provided with a series of funnels which move above the path of movement of the cartons, connecting mechanism whereby the carrier of the weighing mechanism actuates the carton-carrier, mechanism which causes the discharge of the material from the weighing-receptacles into the funnels while in one of the periods of rest in the travel, a pressure device controlled by the carrier-ring near the end of its movement to actuate the pressure device to force the material from the funnel into the carton and then retire, an intermittently-rotating shaft which actuates the carrier, a driving-shaft and clutch connections with said intermittent shaft, and mechanism for throwing said clutch into operative engagement, said mechanism comprising, first, a projection on the reciprocating frame; second, a secondary shaft controlled by the closing movement of the reciprocating frame, a rock-shaft actuated thereby and a wedge-arm carried by said rock-shaft, and, third, a wedge-arm actuated by

the operator in placing a carton in position
for the receiving-funnel, all three of which
sets of mechanism must coöperate before the
clutch connection for driving the carrier can
5 become operative, so arranged that the move-
ment of the carrier-ring is at the will of the
operator in placing a carton in position, pro-
vided the reciprocating frame has closed the
scale-valve and the secondary shaft has com-

pleted a certain movement, substantially as is
described.

In testimony whereof I have affixed my sig-
nature in presence of two witnesses.

WILLIAM H. DOBLE.

Witnesses:

WILLIAM A. COPELAND,
ROBERT WALLACE.