R. B. POLK.

PACKAGING MACHINE.

APPLICATION FILED OCT. 5, 1906.

904,643.

Patented Nov. 24, 1908.

4 SHEETS—SHEET 1.

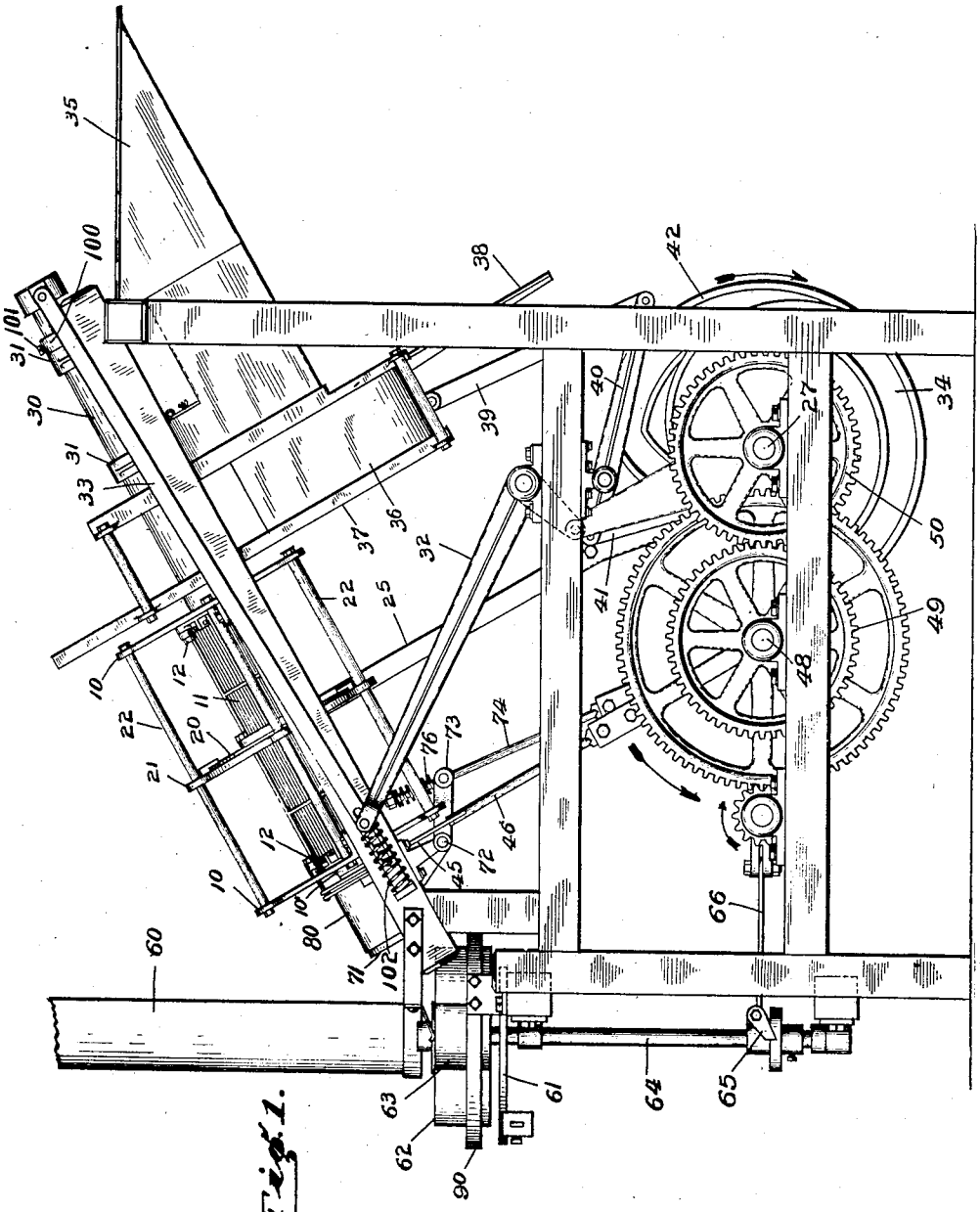


Fig. 1.

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4 SHEETS—SHEET 2.

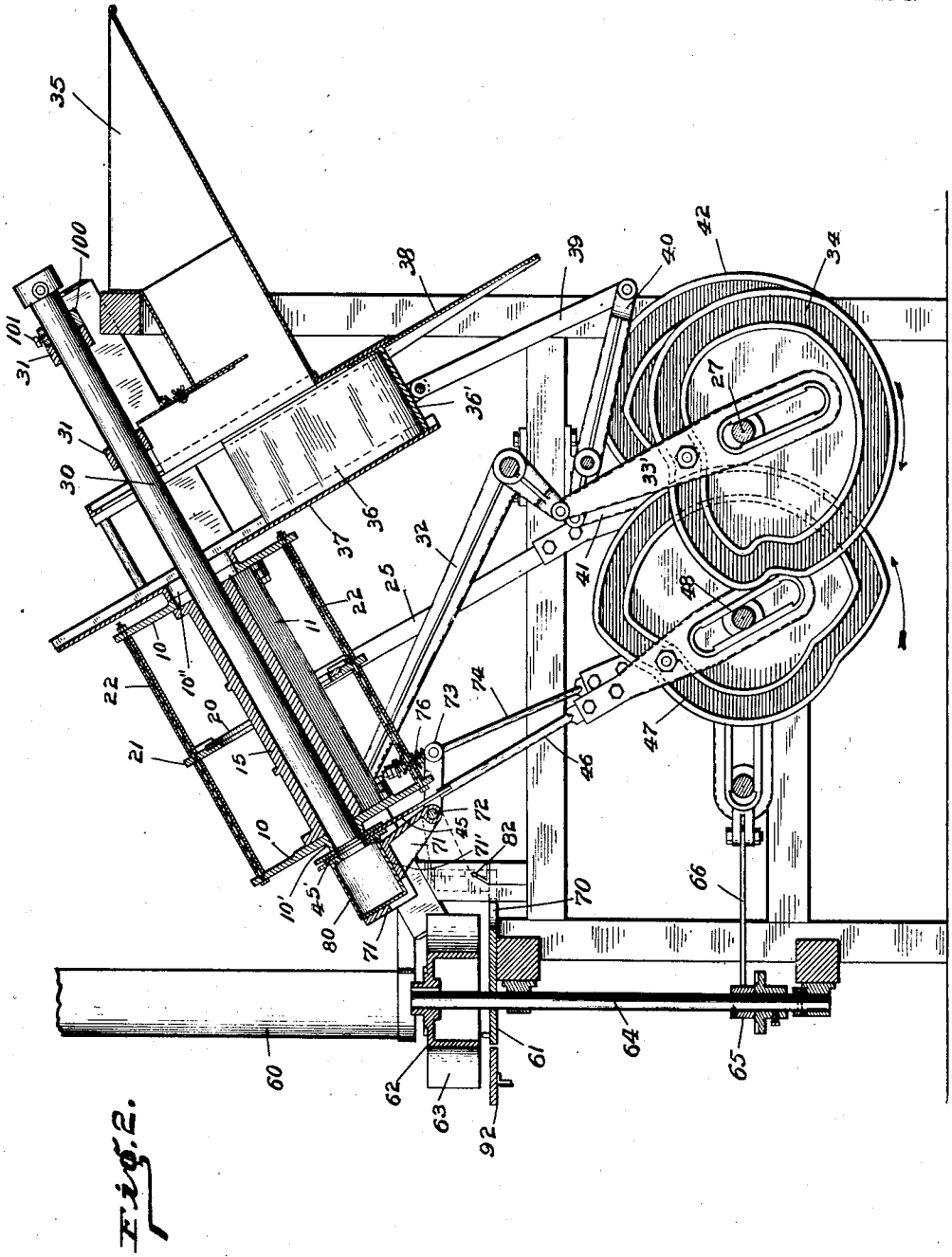


Fig. 2.

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4 SHEETS—SHEET 3.

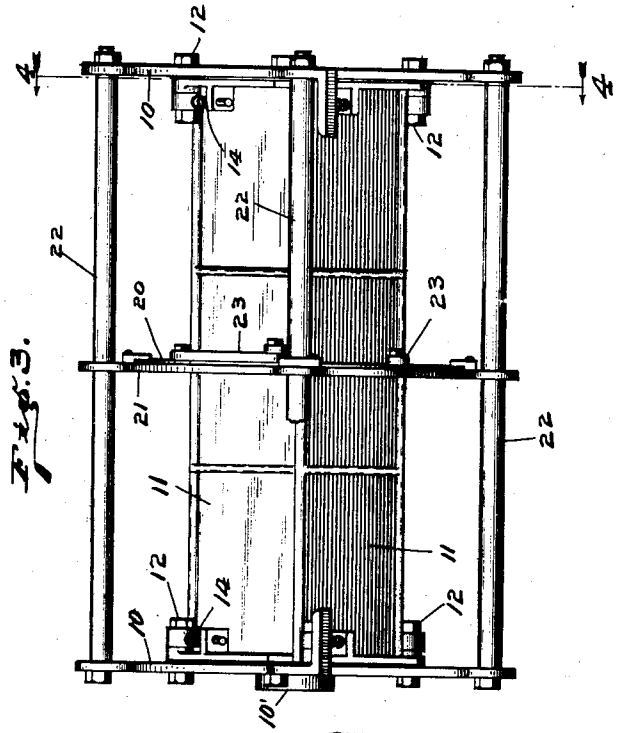


Fig. 3.

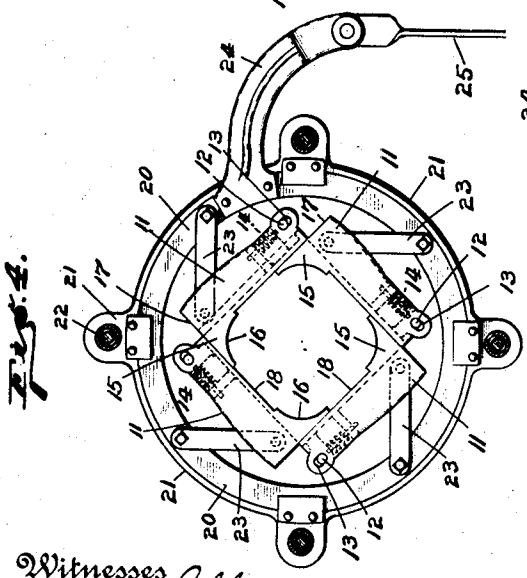


Fig. 4.

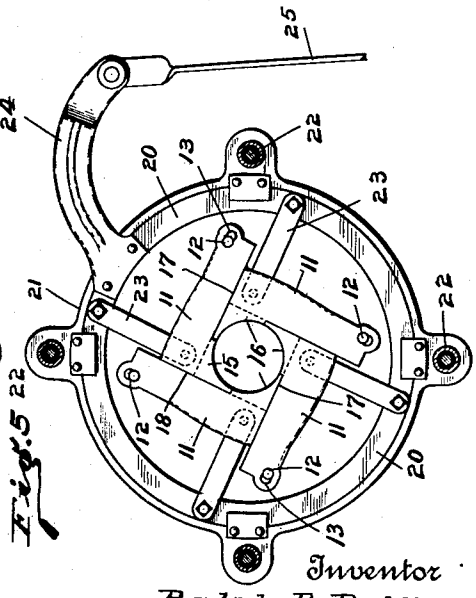


Fig. 5

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4 SHEETS—SHEET 4.

Fig. 6.

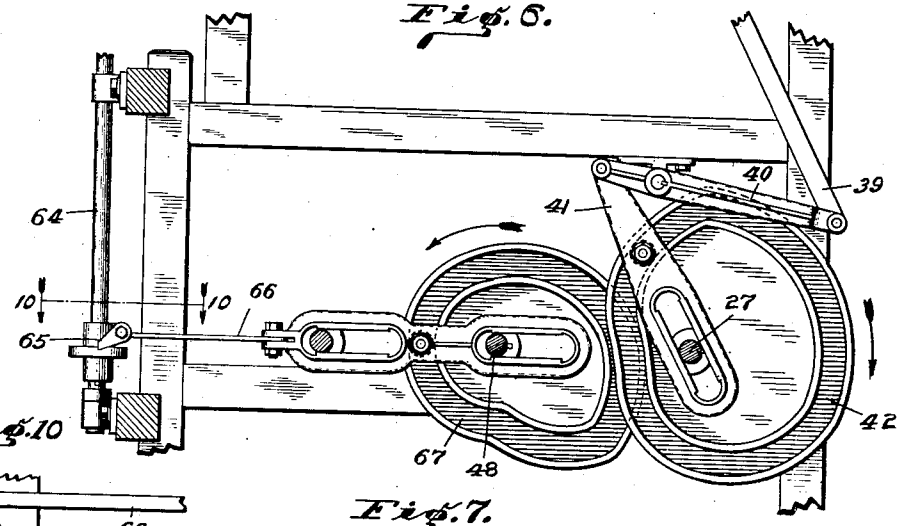


Fig. 10

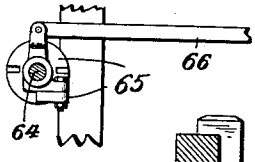


Fig. 7.

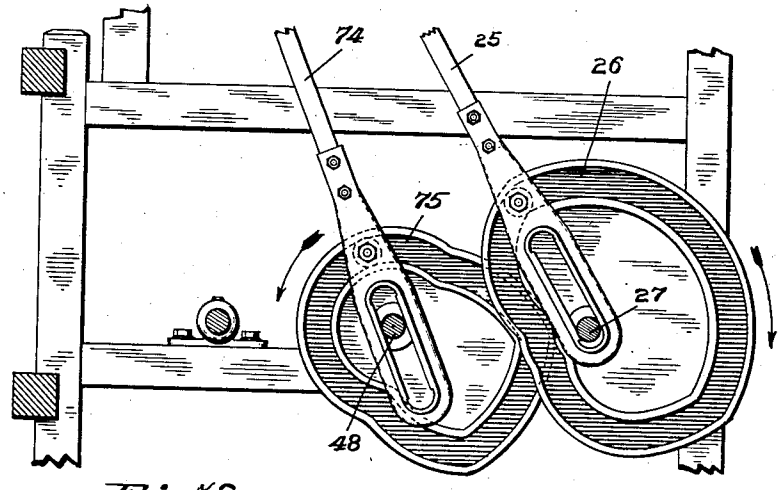


Fig. 8.

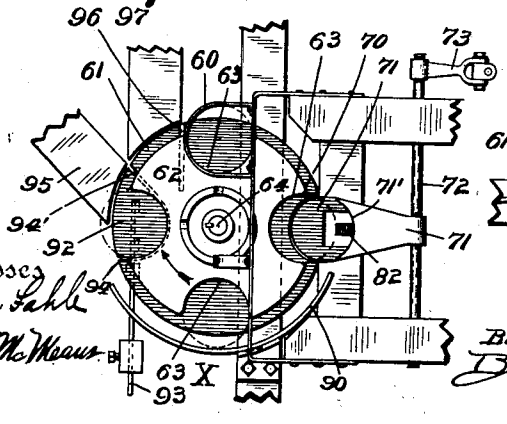
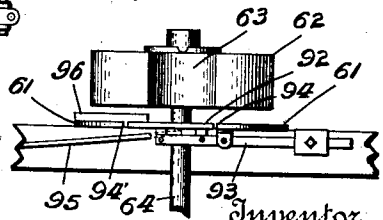


Fig. 9



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UNITED STATES PATENT OFFICE.

RALPH B. POLK, OF GREENWOOD, INDIANA.

PACKAGING-MACHINE.

No. 904,643. Specification of Letters Patent. Patented Nov. 24, 1908.

Application filed October 5, 1906. Serial No. 337,524.

To all whom it may concern:

Be it known that I, RALPH B. POLK, a citizen of the United States, residing at Greenwood, in the county of Johnson and State of Indiana, have invented certain new and useful Improvements in Packaging-Machines, of which the following is a specification.

The object of my invention is to produce a machine for automatically filling packages.

Specifically, the object of my invention is to produce a machine capable of inserting compressible goods into packages through openings smaller than the normal dimensions of the material to be packaged, the apparatus being more especially designed for packaging tomatoes under such conditions that the tomatoes may be inserted whole into standard cans.

The accompanying drawings illustrate my invention, embodying a machine particularly designed for packaging tomatoes.

Figure 1 is a side elevation; Fig. 2, a vertical section; Fig. 3, an elevation, on an enlarged scale, of the compression cylinder; Fig. 4, a section on line 4—4 in Fig. 3, with the compressors in expanded position; Fig. 5, a similar view showing the compressors in closed position; Fig. 6, a vertical sectional detail showing the cams for operating the feeder and the charger; Fig. 7, a vertical sectional detail showing the cams for operating the can-holder and the compressor; Fig. 8, a plan of the feeder and can-holder; Fig. 9, a detail elevation of the automatic weigher; Fig. 10, a detail section on line 10—10 of Fig. 6.

The fundamental feature of my invention resides in the provision of means for reducing the cross-sectional area of the material to be packaged under such conditions that said material is free to expand in a line normal to the compression, and thereafter inserting the distorted material into the package under a pressure normal to the plane of compression, whereby the distorted material is returned substantially to its initial condition after it has entered the package. Consequently, the heart of my present machine consists of a compressing mechanism capable, when in an expanded condition, of receiving a charge of material and thereafter contractible substantially radially of an axis of sufficient length to permit expansion corresponding to the reduced cross-sectional area.

In the drawings, 10—10 indicates a pair of stationary heads between which are pivotally mounted a plurality of coacting plates 11. Each plate is pivotally supported at one edge on bolts 12, which form an axis parallel with the inner face of the plate. The plates are provided at their pivotal ends with slotted openings 13, adapted to receive the bolts 12, in order to permit a slight yield of the plates relative to the bolts, and each plate is yieldingly urged outwardly from its pivotal axis by a spring 14. The outer edge of each plate 11 is thickened at 15 and the inner corner or face of this thickened portion is concaved at 16 so that, when the several plates are brought to contracted position, the several surfaces 16 will form a substantial cylindrical chamber having a diameter equal to or slightly smaller than the diameter of the opening into the package in which the goods are to be placed.

The outer edge of each plate is squared to form a surface 17 which fits and slides upon a surface 18 formed on the inner face of the adjacent plate 11 adjacent the pivoted end thereof, the spring 14 serving to keep surface 17 in contact with surface 18 as the plates 11 are simultaneously swung upon their pivots 12. In order to simultaneously move the plates 11, I provide a ring 20 rotatably mounted in a suitable supporting frame 21 supported by bolts 22 between the two heads 10. Connecting the outer edge of each plate 11 with ring 20 is a link 23, which is pivoted at one end to the ring and at its other end to a point near the outer edge of the adjacent plate 11. Ring 20 is provided with a suitable arm 24 connected by a pitman 25 with a cam 26 carried by shaft 27.

The plate 10 at the discharge end of the compressor is provided with a central opening 10′ of a diameter substantially equal to the diameter of the chamber formed by the collapsed compressor plates 11, as shown in Fig. 5, while the plate 10 at the receiving end is provided with a central opening 10″ of a diameter substantially equal to the diameter of the chamber formed by the expanded compressor plates 11, as shown in Fig. 4. Mounted so as to traverse the chamber formed by the compressor plates 11 is a plunger 30 mounted in suitable bearings 31 and reciprocated by means of a lever 32 connect-

ed thereto by suitable links 33. Lever 32 is operated by means of a pitman 33′ and cam 34 carried by the shaft 27. In order to charge the compressor I provide a hopper 35 which hopper discharges into a reciprocating charger 36 reciprocably mounted between a plate 37 and the discharge end of the hopper 35. Charger 36 is substantially U-shaped in cross section, having high sides and a connecting bottom but no connection between the sides adjacent the plate 37. At the opposite side, the charger 36 is provided with a plate 38 the upper edge of which extends somewhat above the bottom 36′ while the lower end extends considerably below said bottom 36′ so that when the charger is projected upward from the position shown in Fig. 2, plate 38 serves to close the discharge end of hopper 35 and temporarily prevent the flow of material from said hopper. Charger 36 is connected by a link 39 with a lever 40, which lever is operated by means of a pitman 41 and cam 42 carried by shaft 27. Arranged immediately adjacent opening 10′ is a cut-off plate 45 connected by a pitman 46 with a cam 47 carried by shaft 48 geared by gears 49 and 50 to shaft 27.

The present machine is designed for filling cans of ordinary dimensions, and for the purpose of presenting such cans to the compressing mechanism, I provide a can-chute 60 of an ordinary type capable of holding a vertical series of cans and delivering the same to a feeder table 61. Arranged above table 61, between said table and the lower end of chute 60 is a rotary head 62 provided in its circumference with a plurality of can-receiving pockets 63. Head 62 is carried by vertical shaft 64 so that the notches 63 may be presented in succession beneath the lower end of chute 60. In order to move the head 62 step-by-step I provide a pawl and ratchet mechanism 65 connected by a pitman 66 with a cam 67 carried by shaft 48.

At one point the table 61 is provided with a notch 70 which extends toward the center of the table 61 but not so deep as the notch 63. Mounted in this notch is a can-receiver 71 carried by a rock shaft 72, which rock shaft is connected by a lever 73 and pitman 74 with a cam 75 carried by shaft 48. In order that the package may be held tightly against the cut-off guide 45′ pitman 74 is connected to lever 73 through the medium of a spring 76 and the throw of the cam 75 is more than sufficient to swing the arm 71 from receiving to holding position so that, when in holding position, as shown in full lines of Fig. 2, the spring 76 will be compressed.

The operation is as follows; The material to be packed, say tomatoes, is placed in hopper 35 and a quantity approximating sufficient to fill the package flows therefrom into the charger 36. Where tomatoes are being packed they are first scalded as usual to loosen the skins and the skins removed by any desirable process. Assuming the various parts to be in the position shown in full lines in Fig. 2, the several movements are as follows: Plunger 30 will first be rapidly withdrawn to the right and the plates 11 will be swung upon their pivots 12 to their position shown in full lines in Fig. 4. Arm 71 will be thrown down to the position shown in full lines in Fig. 2 and the can 80, as it moves downward with lever 71, will have its inner lower corner brought into engagement with an inclined finger 82, which will serve to shove said can into adjacent notch 63 of head 62 as indicated in dotted lines in Fig. 8. Immediately prior to this movement the cut-off plate 45 will have been moved up so as to close opening 10′. Thereupon cam 67 operates pitman 66 and the pawl and ratchet mechanism 65 to move head 62 in the direction indicated by the arrow in Fig. 8, thus moving a can from the lower end of chute 60 into registry with the notch 70 of the receiving platform and onto platform of lever 71, the center of said can lying inside of the outer end of said receiving platform. Thereupon cam 75 swings lever 71 upward, the can by gravity, settling into the can-receiving pocket 71′ of the lever 71 and being brought to the position shown in full lines of Fig. 2 tightly against the cut-off plate guide 45′. While this movement is taking place charger 36 is moved upward so as to bring plate 38 over the mouth of the hopper 35 and bring the goods within the charger into alinement with the opening 10″, whereupon the goods flow down into the compressing chamber between the expanded plates 11, lying loosely therein in a row. Thereupon cam 26, through pitman 25, shifts ring 20 to swing the plates 11 upon their pivots 12 to the positions shown in Fig. 5. These plates move like an iris diaphragm simultaneously toward the center of the compression chamber so as to reduce its cross section. During this movement the goods within the compression chamber are free to expand in the direction of the axis of the compression chamber, *i. e.*, along lines normal to the plane of compression, and any surplus therein will be squeezed backward into the charger 36. As soon as the compression has taken place the cut-off plate 45 is withdrawn and plunger 30 is projected through the compression chamber so as to force the goods into can 80 subjecting the goods to a pressure normal to the plane of previous reduction sufficient to expand the goods into the package after they have passed through the small entrance opening thereof. As soon as this has occurred, the various motions already described are repeated. As the head 62 is rotated the filled can is moved

from the platform of the lever 71 into engagement with the guard 90, which retains it in its notch of head 62 and when the can reaches the point "X" (Fig. 8) it is in position to "top" *i. e.* (any surplus removed or deficiency made up) by an operator. The next movement of head 62 shifts the filled can on to a weighing platform 92 supported upon a weighted lever 93 in a notch 94 formed in table 93. If the can has received its proper charge by weight it will depress the platform 92 and bring it into alinement with a discharge chute 95 at a lower level than the table 61 so that, when the head 62 is again moved forward, the can will come into engagement with the edge 94′ of the notch 94 and the movement of the head 62 will serve to project the can from platform 92 on to the chute 95. If, on the other hand, the can has not received its proper charge by weight it will not be heavy enough to depress platform 92, and the next movement of the head 62 will shift the can on to platform 61 adjacent a vertical flange 96 which, as the head moves forward, serves to discharge the deficient can upon the chute 97. In order to regulate the amount of material to be delivered to the package 80, plunger 30 is provided with a collar 100 longitudinally adjustable on the plunger by means of a set screw 101, the collar serving to limit the ejecting throw of the plunger. In order to permit this adjustment without changing the cam 34 the connection between lever 32 and a link 33 consists in part of a spring 102.

I claim as my invention;

1. In a packaging machine, the combination with a package holder, of a material receiver having a cross-section greater than that of the package mouth and a length greater than that required to receive a charge, in its original condition, for the package, means for reducing the cross-section of the receiver to approximate that of the package mouth, and means for ejecting the material from the collapsed receiver into the package.

2. In a packaging machine, the combination with a package holder, of a material receiver having a cross-section greater than that of the package mouth and a length greater than that required to receive a charge, in its original condition, for the package, means for reducing the cross-section of the receiver to approximate that of the package mouth, and means for ejecting the material from the collapsed receiver into the package and subjecting the ejected material to a pressure at an angle to its plane of reduction, whereby the material is caused to approach its original condition.

3. In a packaging machine, a receiver formed of a plurality of mating members movable toward and from the axis of the receiver, and means for moving said members to reduce the cross-sectional area of the receiver and thereby distort the material within the receiver, such mating members having an axial length sufficient to form a receiver having a length in excess of that necessary to receive, in its original condition, a charge for the package, a package holder, and means for ejecting distorted material from the reduced receiver into a package.

4. In a packaging machine, a receiver formed of a plurality of mating members pivoted upon axes parallel with the axis of the receiver, and means for swinging said members toward and from the receiver axis to reduce or increase the cross-sectional area of the receiver, such mating members having an axial length sufficient to form a receiver having a length in excess of that necessary to receive, in its original condition, a charge for the package, a package holder, and means for ejecting distorted material from the reduced receiver into a package.

5. In a packaging machine, a receiver formed of a plurality of mating members movable toward and from the axis of the receiver, and means for moving said members to vary the cross-sectional area of the receiver, such mating members having an axial length sufficient to form a receiver having a length in excess of that necessary to receive, in its original condition, a charge for the package, a package holder, and means for ejecting distorted material from the reduced receiver into a package under a pressure at an angle to the plane of distortion whereby the material is caused to approach its original condition after entering the package.

6. In a packaging machine, a receiver formed of a plurality of mating members pivoted upon axes parallel with the axis of the receiver, and means for swinging said members toward and from the receiver axis to reduce or increase the cross-sectional area of the receiver, such mating members having an axial length sufficient to form a receiver having a length in excess of that necessary to receive, in its original condition, a charge for the package, a package holder; and means for ejecting distorted material from the reduced receiver into a package under a pressure at an angle to the plane of distortion whereby the material is caused to approach its original condition after entering the package.

7. In a packaging machine, a material-distorting receiver formed of a plurality of overlapping plates, the end of one co-acting with the inner face of the next adjacent plate and the inner faces thereof forming the walls of the receiver, a pivotal support for each of said plates substantially parallel with the axis of the receiver, and means for swinging said plates simultaneously toward the axis of the receiver.

8. In a packaging machine, a material-distorting receiver formed of a plurality of overlapping plates each having a transversely yielding pivotal support parallel with the axis of the receiver and the free end of each coöperating with the inner face of the next adjacent plate, and means for simultaneously swinging said plates on their pivots.

9. In a packaging machine, the combination, with a hopper adapted to contain a considerable quantity of material to be packaged, a measuring receptacle communicating with the discharge outlet of said hopper and having a capacity approximating the capacity of the package, means for shifting said measuring receptacle relative to the hopper, a collapsible receiver having an initial capacity in excess of the capacity of the package, and arranged to receive a charge from the measuring receptacle, means for collapsing said collapsible receiver whereby the charge therein is distorted and reduced in one dimension while free to expand within the said receiver in another direction, a package holder adapted to hold a package in position to receive material ejected from the collapsible receiver, and means for ejecting material from the collapsed receiver into the package.

10. In a packaging machine, the combination, with a hopper adapted to contain a considerable quantity of material to be packaged, a measuring receptacle communicating with the discharge outlet of said hopper and having a capacity approximating the capacity of the package, said measuring receptacle bearing such relation to the hopper that its movement relative thereto will eject the surplus material therefrom without cutting, means for shifting said measuring receptacle relative to the hopper, a collapsible receiver having an initial capacity in excess of the capacity of the package and arranged to receive a charge from the measuring receptacle, means for collapsing said collapsible receiver whereby the charge therein is distorted and reduced in one dimension while free to expand within the said receiver in another direction, a package holder adapted to hold a package in position to receive material ejected from the collapsible receiver, and means for ejecting material from the collapsed receiver into the package.

11. In a packaging machine, the combination, with a hopper adapted to contain a considerable quantity of material to be packaged, a measuring receptacle communicating with the discharge outlet of said hopper and having a capacity approximating the capacity of the package, said measuring receptacle bearing such relation to the hopper that its movement relative thereto will eject the surplus material therefrom without cutting, means for shifting said measuring receptacle relative to the hopper, a collapsible receiver having an initial capacity in excess of the capacity of the package and arranged to receive a charge from the measuring receptacle, means for collapsing said collapsible receiver whereby the charge therein is distorted and reduced in one dimension while free to expand within the said receiver in another direction, a package holder adapted to hold a package in position to receive material ejected from the collapsible receiver, a plunger adapted to fit the collapsed receiver, and means for causing said plunger to traverse said collapsed receiver to eject material therefrom into the package.

12. In a packaging machine, the combination, with a hopper adapted to contain a considerable quantity of material to be packaged, a measuring receptacle communicating with the discharge outlet of said hopper and having a capacity approximating the capacity of the package, means for shifting said measuring receptacle relative to the hopper, a collapsible receiver having an initial capacity in excess of the capacity of the package, and arranged to receive a charge from the measuring receptacle, means for collapsing said collapsible receiver whereby the charge therein is distorted and reduced in one dimension while free to expand within the said receiver in another direction, a package holder adapted to hold said package in position to receive material ejected from the collapsible receiver, a plunger adapted to fit the collapsed receiver, and means for causing said plunger to traverse said collapsed receiver to eject material therefrom into the package.

13. In a packaging machine, the combination, with a hopper adapted to contain a considerable quantity of material to be packaged, a measuring receptacle communicating with the discharge outlet of said hopper and having a capacity approximating the capacity of the package, means for shifting said measuring receptacle relative to the hopper, a collapsible receiver having an initial capacity in excess of the capacity of the package, and arranged to receive a charge from the measuring receptacle, means for collapsing said collapsible receiver whereby the charge therein is distorted and reduced in one dimension while free to expand within the said receiver in another direction, a package delivering means, a package holder to receive packages from said delivering means, and means for moving said package holder from receiving position into position to hold the package for reception of material from the collapsible receiver.

14. In a packaging machine, the combination, with a hopper adapted to contain a con-

siderable quantity of material to be packaged, a measuring receptacle communicating with the discharge outlet of said hopper and having a capacity approximating the capacity of the package, said measuring receptacle bearing such relation to the hopper that its movement relative thereto will eject the surplus material therefrom without cutting, means for shifting said measuring receptacle relative to the hopper, a collapsible receiver having an initial capacity in excess of the capacity of the package and arranged to receive a charge from the measuring receptacle, means for collapsing said collapsible receiver whereby the charge therein is distorted and reduced in one dimension while free to expand within the said receiver in another direction, a package delivering means, a package holder adapted to receive packages from said delivering means, and means for moving said package holder from receiving position into position to hold the package for reception of material from the collapsible receiver.

15. In a packaging machine, the combination, with a hopper adapted to contain a considerable quantity of material to be packaged, a measuring receptacle communicating with the discharge outlet of said hopper and having a capacity approximating the capacity of the package, said measuring receptacle bearing such relation to the hopper that its movement relative thereto will eject the surplus material therefrom without cutting, means for shifting said measuring receptacle relative to the hopper, a collapsible receiver having an initial capacity in excess of the capacity of the package and arranged to receive a charge from the measuring receptacle, means for collapsing said collapsible receiver whereby the charge therein is distorted and reduced in one dimension while free to expand within the said receiver in another direction, a package delivering means, a package holder adapted to receive packages from said delivering means, means for moving said package holder from receiving position into position to hold the package for reception of material from the collapsible receiver, a plunger adapted to fit the collapsed receiver, and means for causing said plunger to traverse said collapsed receiver to eject material therefrom into the package.

16. In a packaging machine, the combination, with a hopper adapted to contain a considerable quantity of material to be packaged, a measuring receptacle communicating with the discharge outlet of said hopper and having a capacity approximating the capacity of the package, means for shifting said measuring receptacle relative to the hopper, a collapsible receiver having an initial capacity in excess of the capacity of the package, and arranged to receive a charge from the measuring receptacle, means for collapsing said collapsible receiver whereby the charge therein is distorted and reduced in one dimension while free to expand within the said receiver in another direction, a package-delivering means, a package holder adapted to receive packages from said delivering means, means for moving said package holder from receiving position into position to hold the package for reception of material from the collapsible receiver, a plunger adapted to fit the collapsed receiver, and means for causing said plunger to traverse said collapsed receiver to eject material therefrom into the package.

17. In a packaging machine, the combination, of a rotary head adapted to receive a succession of packages, a feed chute leading said packages to said head, a package holder, means for engaging successive packages with said holder and extracting such packages from and returning them to said head, a weighing-platform arranged in the path of movement of the packages carried by said head, and a pair of discharge chutes one leading from said weighing platform and the other from a point beyond the weighing platform, and means for ejecting packages from the head to said chute.

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, this 28th day of September, A. D. one thousand nine hundred and six.

RALPH B. POLK. [L. S.]

Witnesses:
ARTHUR M. HOOD,
THOMAS W. MCMEANS.