No. 897,091. PATENTED AUG. 25, 1908.

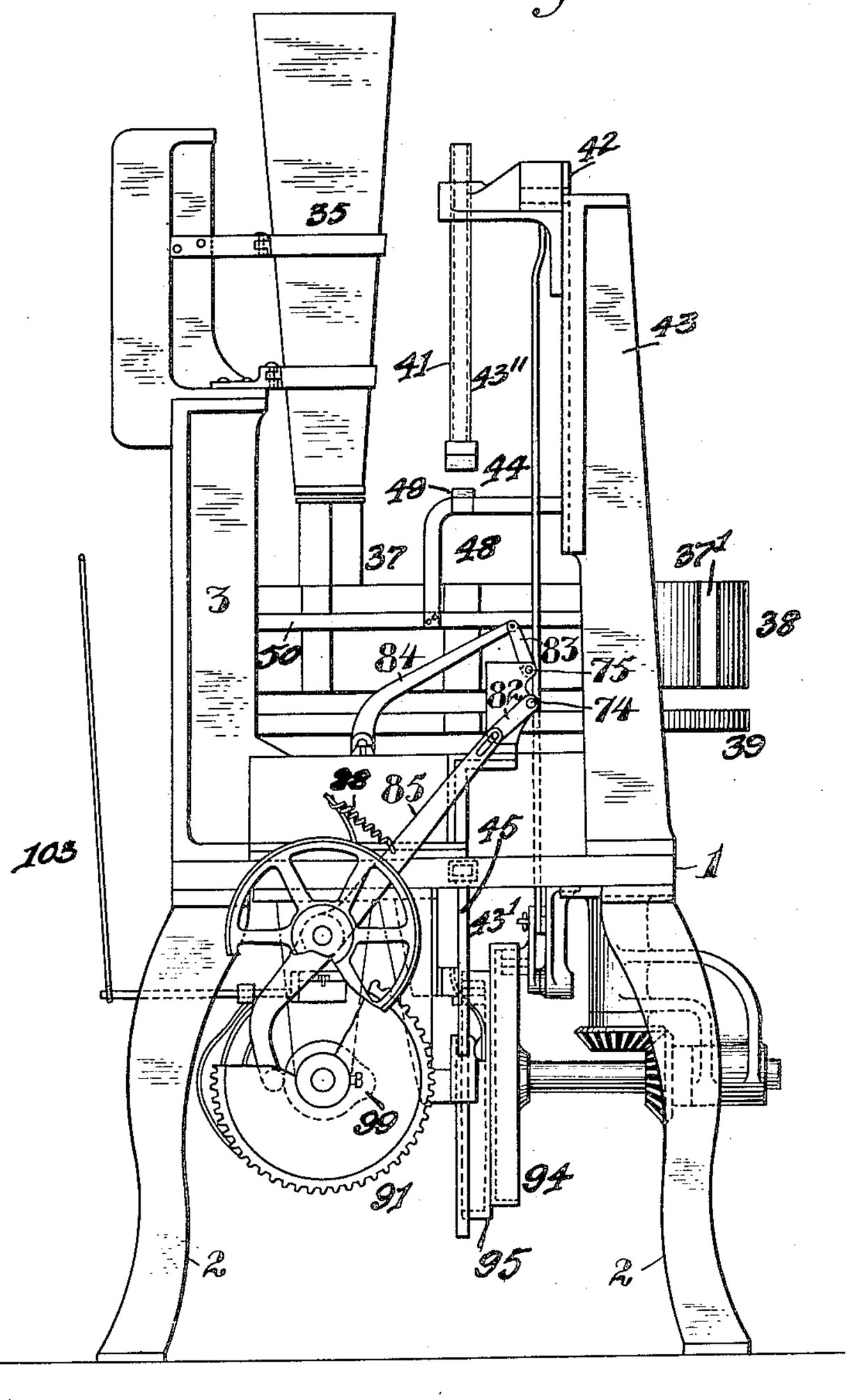
J. A. GRAY.

AUTOMATIC PACKING MACHINE.

APPLICATION FILED DEC. 5, 1905.

5 SHEETS—SHEET 1.

Fig. 1.



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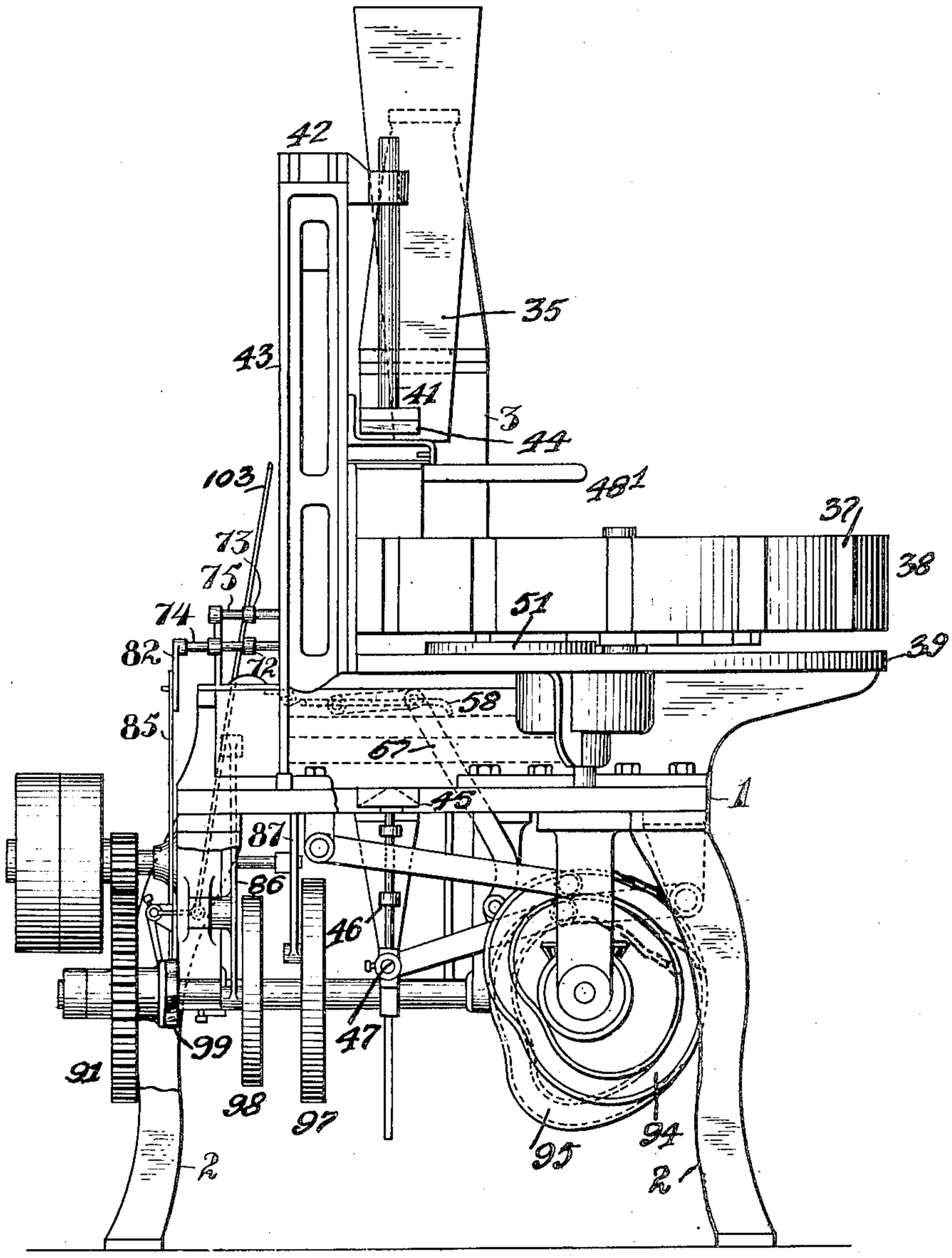
5 SHEETS—SHEET 2.

Fig. 2.



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5 SHEETS—SHEET 3.

Fig. 4.

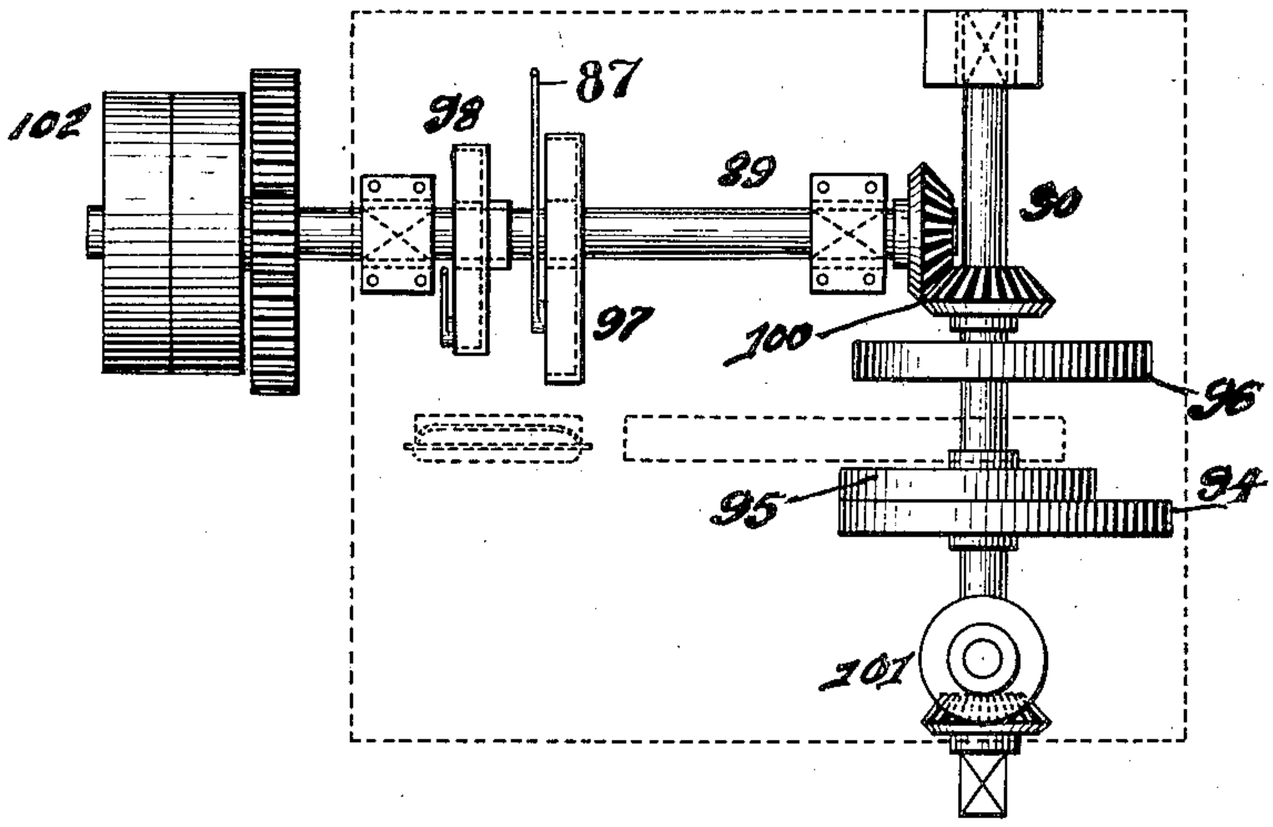
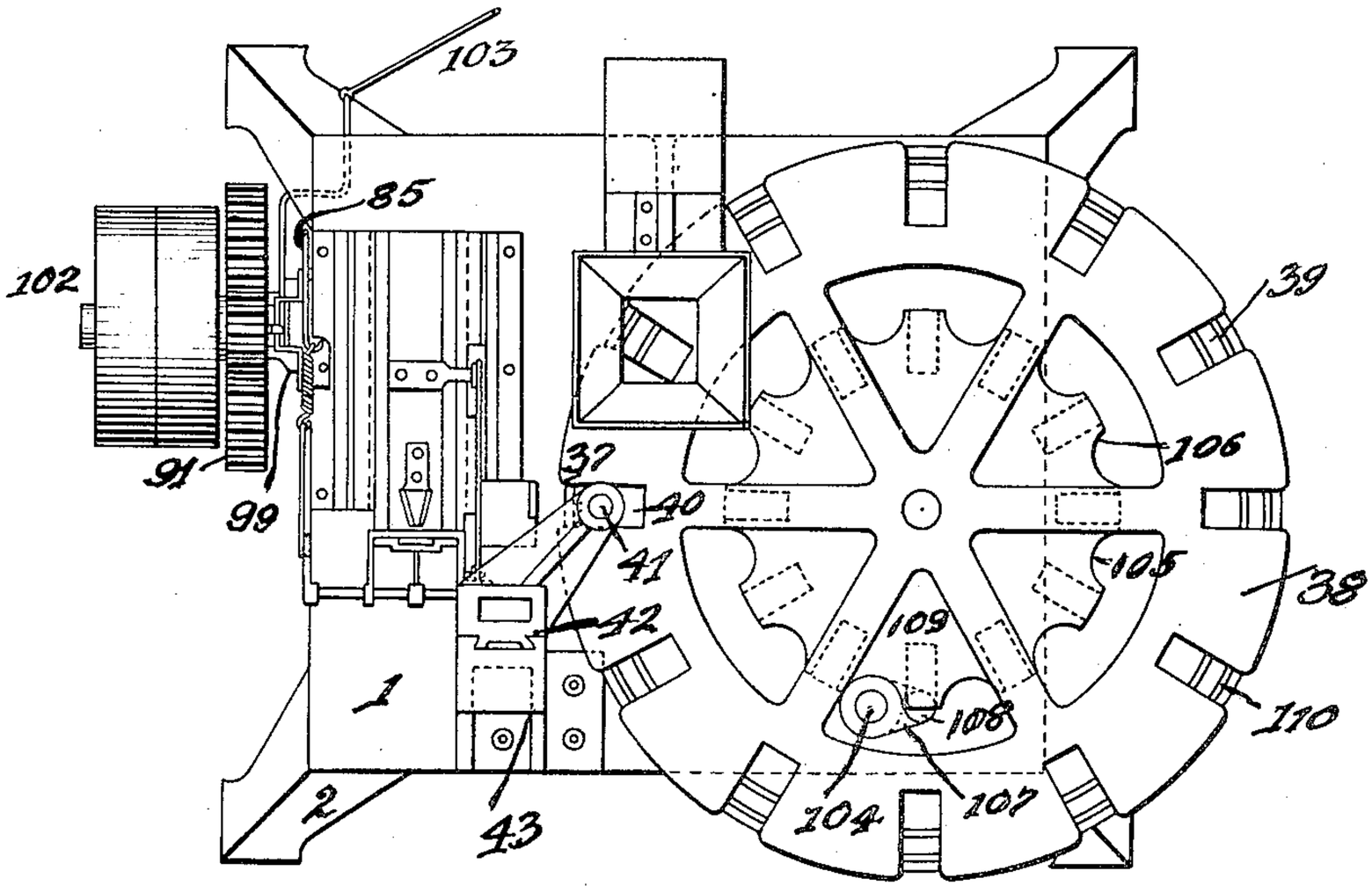


Fig. 3.



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No. 897,091. PATENTED AUG. 25, 1908.

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5 SHEETS—SHEET 4.

Fig. 7.

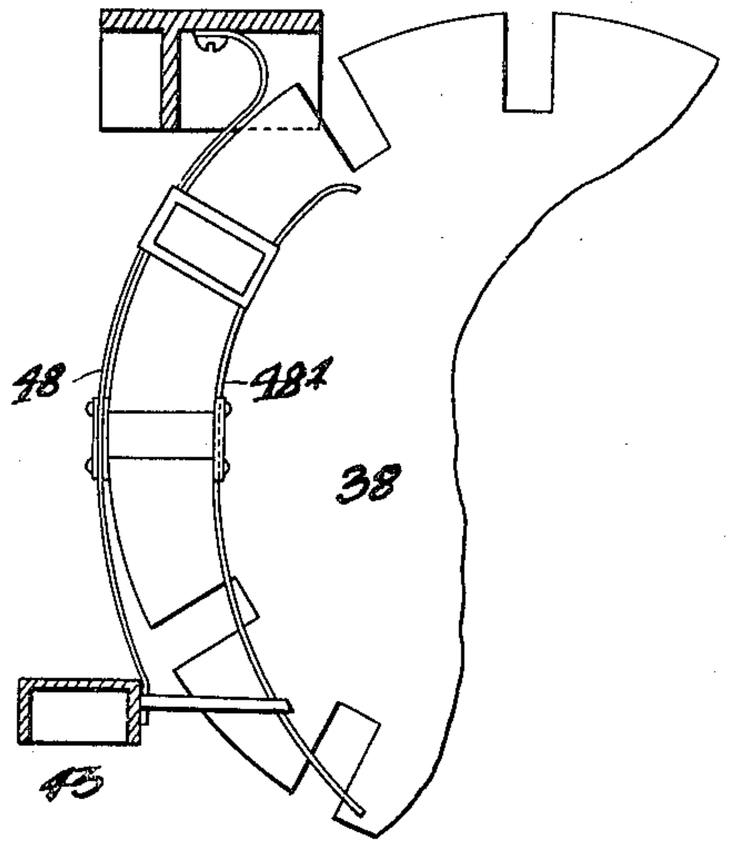


Fig. 5.

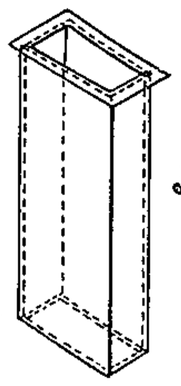


Fig. 8.

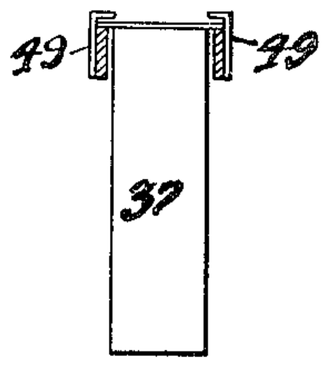


Fig. 9.

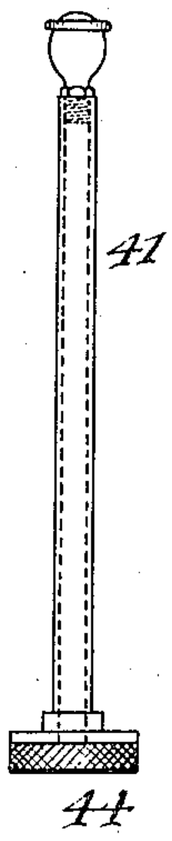
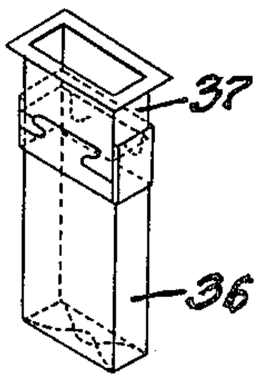


Fig. 6.



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AUTOMATIC PACKING MACHINE.

APPLICATION FILED DEC. 5, 1905.

5 SHEETS—SHEET 5.

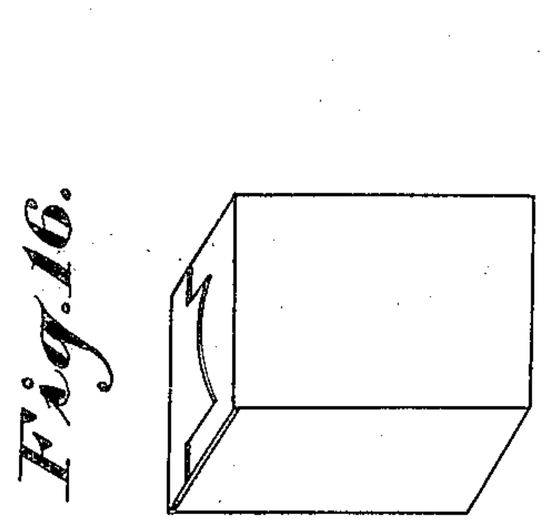
Fig. 16.

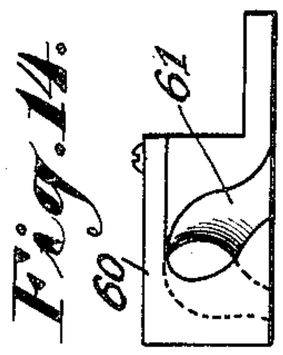
Fig. 14.

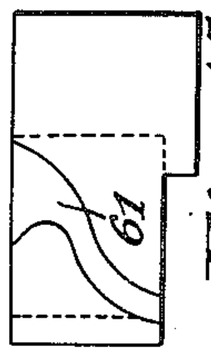
Fig. 15.

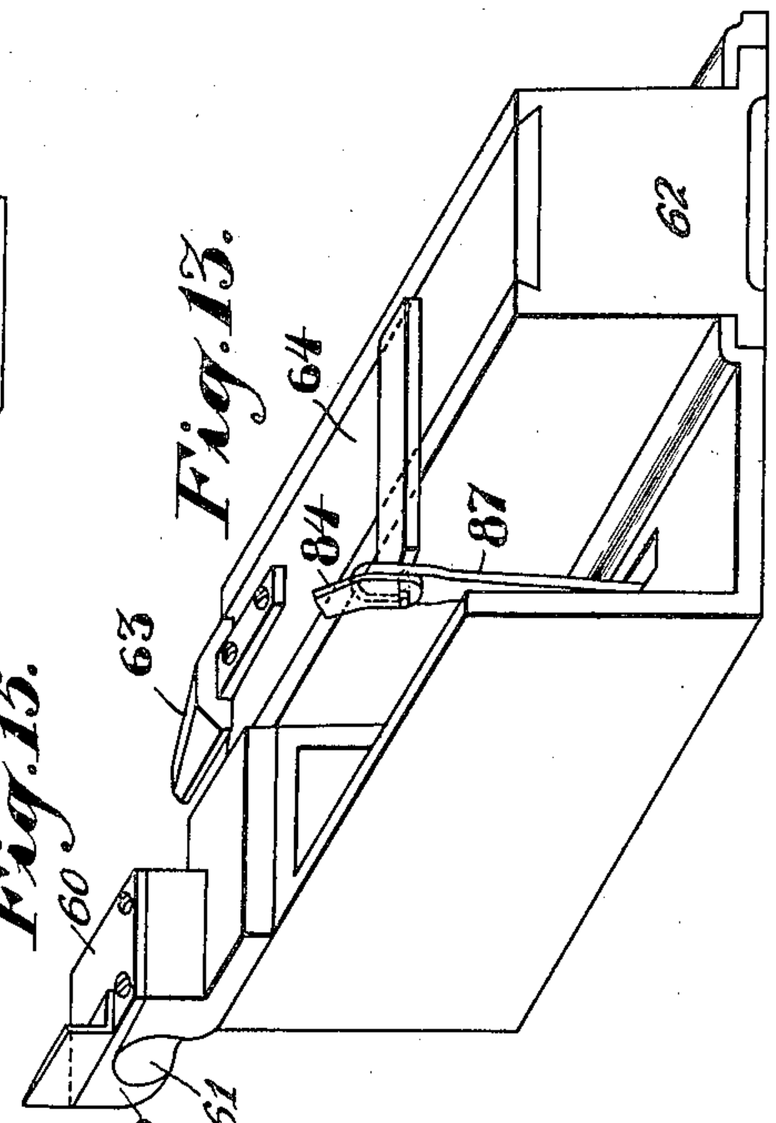
Fig. 13.

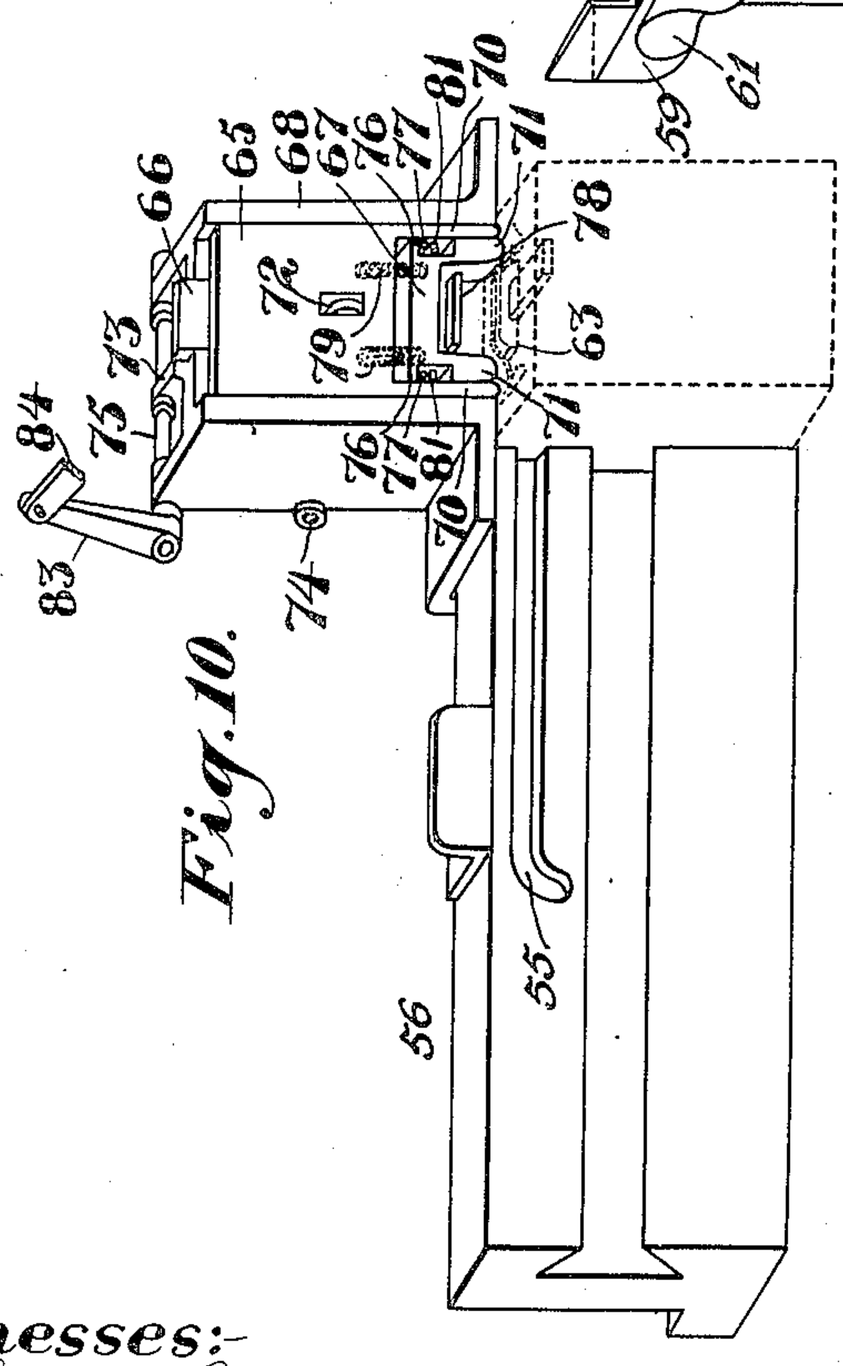
Fig. 10.

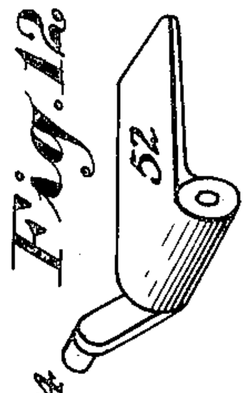
Fig. 12.

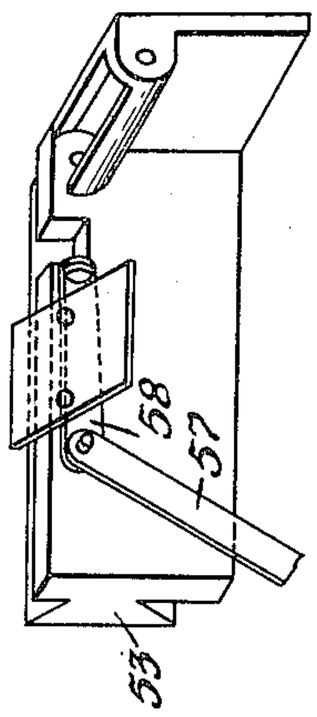
Fig. 11.

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UNITED STATES PATENT OFFICE.

JAMES ALFRED GRAY, OF SAN FRANCISCO, CALIFORNIA.

AUTOMATIC PACKING-MACHINE.

No. 897,091. Specification of Letters Patent. Patented Aug. 25, 1908.

Application filed December 5, 1905. Serial No. 290,409.

To all whom it may concern:

Be it known that I, JAMES ALFRED GRAY, citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Automatic Packing-Machines, of which the following is a specification.

My invention relates to what are known as packing machines and more particularly to machines for automatically packing small fruits as raisins, etc.

The object of the invention is to provide a machine in which the material to be packed, preferably delivered in separate charges from some suitable weighing machine, is deposited in packages, wrappers or cartons, which are then closed and delivered by the machine.

The accompanying drawings illustrate one form of mechanism embodying the invention, in which:

Figure 1 is a side elevation: Fig. 2 is a front elevation; Fig. 3 is a plan view; Fig. 4 is a plan view of the cams and driving mechanism. Fig. 5 is a perspective view of the funnel. Fig. 6 is a perspective view of the funnel and carton. Fig. 7 is a plan view of the funnel guide and ejector. Fig. 8 is a cross section on the line 10—10 in Fig. 9. Fig. 9 is a detail view of the top plunger. Fig. 10 is a perspective view of the buttoner, and of the guide for the slide which carries one of the folding fingers. Fig. 11 is a perspective view of the said slide. Fig. 12 is a similar view of the said folding finger. Fig. 13 is a perspective of the means for carrying the carton under the buttoning device. Fig. 14 is a side view of the slotted folder. Fig. 15 is a plan view of the same. Fig. 16 is a view of a folded carton.

In these drawings, 1 represents the base of the machine which is mounted upon legs 2 and supports the operating mechanism. Extending up from one side of the base is a standard 3, which may be adapted to support any suitable measuring or weighing apparatus for supplying successive amounts or charges of the material to be packaged. This material is received by a substantially cylindrical chute or hopper 35 from whence it passes into the packages or cartons 36 which have been placed upon the lower ends of funnels 37 by an attendant. The funnels are placed in recesses 37′ in the periphery of a carrier, as a rotary table or platform 38, and carried around under the lower end of the chute 35. The lower ends of the cartons are supported by a stationary table 39 which is provided with a notch or recess 40 through which each carton is forced after it has been filled ready for the folding and closing mechanism. The hopper is preferably separated longitudinally so that it may be opened and cleaned in case it should become foul or clogged and its lower end is formed rectangular so as to substantially correspond with the shape and size of the receptacle into which it discharges.

After the material has been deposited in the funnel and carton it is slightly compressed therein by a plunger 41 which is connected with a slide block 42 that is mounted in a standard 43 and reciprocated by a lever 43′ and link 43″. The head of the plunger is preferably provided with porous block 44, as of felt which is moistened from water that is contained in the hollow stem, thereby preventing the material from being lifted out of the funnel by the return movement of the plunger which is apt to be done when the material is sticky, as is the case with fresh raisins, and especially when being handled in the hot climate of the raisin country.

The plunger is located directly above the recess 40 so that the platform 38 must be moved one step after the material has been deposited and which will also permit of the carton and its contents being slipped off of the lower end of the funnel and carried down through the recess by the plunger 41 and deposited on the base 1. As the carton is being lowered onto the base it is supported on a plunger 45 that is mounted in bearings 46 and actuated by a lever 47 which is controlled by the driving mechanism. During the discharge of the carton the funnel is supported by two curved guides 48 and 48′ which are secured to the standard 43, and each of them is provided with a lip 49 which prevents the funnel from rising with the withdrawal of the plunger 41. One of the guides is connected with a curved guard 50 which partially encircles the platform 38 and holds the funnels in their recesses while the cartons are being filled, and the other guide, in conjunction with a similarly curved guard 51 on the table 39, forms an ejector which gradually forces the funnels out of the recesses after the cartons have been removed therefrom.

When the cartons are delivered to the base 1, the flaps or folds at the upper end stand

open or substantially in line with the sides and are to be folded down and interlocked as the carton is being discharged. The first fold is made by a finger 52 on a slide 53 which is caused to move down over the top of the carton by a tail piece 54 which normally rests in a recess 55 in the side of a guide block 56 and lets the finger stand vertically, but as soon as the slide is moved forward by the lever 57 and link 58, the tail is dragged out of the recess and the finger is forced into a horizontal position, carrying the flap or fold of the carton with it. As the slide moves forward, the opposite flap is engaged by the forward end of the presser foot 59 of a longitudinally slotted folder 60 and is folded down, after which, one of the side flaps is gradually turned over onto the two edge flaps by the wall 61 of the slot of the presser which is helically curved so as to finally overhang the tip or rear end of the foot 59, something similar to a hemmer in a sewing machine, and thereby presses the side flap down into a horizontal position as the carton emerges from under the folder. As soon as the carton reaches this point it is engaged by a slide 62 and carried under a buttoning device which folds the remaining flap down over a nose 63 on the forward end of a plunger 64 that is reciprocally mounted on top of the slide 62 in position to rest directly above the top of the carton as it passes out from under the folder and is carried under the buttoner by the slide. This final flap is the locking flap, and is not only folded down, but is locked in slits formed in the side flap immediately beneath and which has already been folded. One member of the buttoner is a plunger 66 having a foot 78, which, when the carton is pushed in, and while stationary, partly folds down the flap which is somewhat curved by the nose in order to facilitate the entrance of its locking pieces or projections into the usual slits in the folded side flap. Another plunger 65 has a bifurcated lower end forming two prongs 70 which straddle the nose and by entering the slits in the folded side flap open such slits out. Connected with the plunger 65 by springs 79, is a supplementary plunger 67 having round ended projections 71 which likewise straddle the nose and which, at the proper time, force the locking pieces into the slits, after such slits have been entered by the prongs 70. The sides of the plunger 67 are recessed, forming shoulders 76; and the downward motion of said plunger is limited by stop pins 77 projecting forwardly from the bracket 68 in which all these plungers are movable.

The upward motion of the plunger 65 is limited by pins 81 projecting from the prongs 70, which are stopped by the pins 77 above them. The plungers 65 and 66 are operated from the driving mechanism of the machine as hereinafter explained; the direct operating connections for said plungers being a lever 72 which enters a slot in the plunger 65 and is connected to a rock shaft 74, and a lever 73 which enters a slot in the plunger 66 and is connected to a rock shaft 75. The rock shaft 74 has a crank 82 from which a pitman 85 extends to the driving mechanism as shown in Fig. 2. The shaft 75 has a crank 83 from which a pitman 84 extends to the lever 87 which operates the slide 64 as shown in Figs. 10 and 13 taken together.

The sequence in operation of the buttoning mechanism is as follows: The plunger 65 first moves down, and as it has a spring connection with plunger 67, it is able to move a short distance independently and so opens out the slits. Immediately thereafter it causes the plunger 67 to move downwardly, so that the projections 71 bear upon the locking pieces of the flap and push them into the slits. The plunger 65 now rises independently of plunger 67, which is held down by the springs 79, and the slide 64 is moved, gradually withdrawing the nose 63 and by the same movement bringing down the plunger 66 which straightens and flattens out the flap and pushes the locking pieces into the slits to the full extent. The foot 78 of the returning plunger 66 moves the plunger 67 upward to its normal position. The closing of the carton is now complete, and it is carried on and out from under the bracket 68, ready to be finally removed.

The driving mechanism comprises two shafts 89 and 90 journaled at right angles to each other under the table 1 and provided with a driving gear 91, cams 94, 95, and 96 on the shaft 90, and cams 97, 98, and 99 on the shaft 89, and two pairs of bevel gearing 100 and 101. The gear 91 is driven by a pinion and a pulley 102 and connected with the shaft 89 by any ordinary clutch mechanism which is adapted to be automatically thrown out of engagement at every revolution, and which is thrown into engagement by a rod 103 which is actuated by the operator, or, if a weighing mechanism is associated with the packaging machine, can be connected to some moving part of such weighing mechanism so as to start the driving machinery at the proper times.

The cam 94 actuates the lever 43′ which packs the material in the carton by means of the plunger 41, after which the cam 95 by means of the lever 47 moves the plunger 45 in unison with the plunger 41 to deposit the carton on the base 1. The cam 96 through the lever 57 and link 58 then moves the slide 53 forward which causes the finger 52 and presser foot 59 to close the edge flaps as the carton is carried under the folder 60, which movement also closes one of the side flaps. The cam 97 then actuates the plunger 64 through the lever 87 so as to cause the nose

63 to move forward a short distance at the same time that the cam 98, by means of the lever 86, moves the slide 62 forward so as to carry the carton partly under the buttoner and cause the remaining flap to be folded down onto the nose 63. The cam 99 then actuates the plunger 65 through the lever 85 and causes the locking pieces of the top flap to enter their respective openings, after which the nose is withdrawn and the plunger 66 is drawn down by the receding movement of the plunger 64 through the link 84 and thereby completes the closure of the package. The slide 62 then completes its forward movement which forces the carton from under the buttoner ready to be removed by the attendant, after which it returns to its normal position and the clutch mechanism is stopped.

The table 38 is rotated by what is known as a Geneva movement in which a shaft 104 which is actuated by the gearing 101 is provided at its upper end with a semi-cylindrical head which is adapted to fit any one of a series of recesses 105 in a plate 106 that is secured to the under side of the table 38. A short arm 107 at the upper end of the shaft or on the head is provided with a pin 108 which is adapted to pass into and through any one of a series of slots 109 between the recesses 105 and rotate the table one step for each revolution of the shaft 104 which is arranged to make a revolution every time the driving mechanism is operated. The top of the table 39 may be provided with circular ribs 110, if desired to permit of the cartons being moved around by the table 38 without danger of sticking, as would apt to be the case when working with such sticky substances as fresh raisins in a hot country.

In preparing the funnels, the assistant folds the thin wrapping paper over the lower end of each funnel in the same manner as would be done with one end of a solid package, which leaves the paper extending around the sides of the funnel nearly to the upper edges of the flaps of the carton when the funnel is inserted thereinto. In folding the flaps to close the cartons the upper edge of the thin paper is folded down with the flaps and thereby covers the material but none of the paper is exposed or projects beyond the edges of the flaps.

As fast as the emptied funnels are discharged from the revolving table their places are filled with those on which the attendant has placed the oiled paper and an empty carton, which are carried around and again discharged after the carton has been filled and removed therefrom.

Although I have shown a very desirable form of machine for practicing my invention it is evident that alterations and modifications can be made therein and I reserve the right to make all such changes and modifications as will come within the scope of my invention.

Having described my invention what I claim as new and desire to secure by Letters Patent, is:—

1. In a packing machine, a recessed table adapted to hold funnels provided with cartons, means for filling the cartons, means for moving the funnels to said recesses, means for removing the cartons from the funnels through the recess in the table, means for ejecting the funnels, and means for closing the cartons.

2. In a packing machine, a recessed table adapted to hold funnels, each provided with a carton, means for filling the cartons, means for moving the funnels to said recess, a plunger for compressing said filling and removing the cartons from the funnels through the recess in the table, means for supporting the carton during said removal, and means for closing the cartons.

3. In a packing machine, a recessed table adapted to hold funnels provided with cartons, means for filling the cartons, means for moving the funnels to said recess, a plunger for compressing said filling and removing the cartons from the funnels through said recess, a plunger for engaging with the bottom of the carton and supporting it during said removal, and means for closing the cartons.

4. In a packing machine, a recessed table adapted to hold funnels provided with cartons, means for filling the cartons, means for moving the funnels to said recess, a plunger for compressing said filling and removing the cartons from the funnels through said recess, means for holding the funnels on the table during the removal of the plunger, means for ejecting the funnels from the table after the cartons have been removed, and means for closing the cartons.

5. In a packing machine, a revolving recessed platform adapted to hold funnels provided with cartons, a recessed table below the platform, means for filling the cartons, a plunger for compressing said filling and removing the carton from the funnels, two brackets, each provided with means for holding the funnels on the table during the withdrawal of the plunger, one of the brackets forming a guard around the platform and the other one forming part of an ejector, a curved guide on the table for forming the remainder of the ejector, and means for closing the cartons.

6. In a packing machine, a slide for closing one flap of a carton and for moving said carton under a folder, a folder, having a slot, for closing two flaps of said carton, and means for closing the fourth flap when the carton is moved at an angle to the slot in the folder.

7. In a packing machine, a folder, a slide provided with a finger for closing one of the flaps of a carton and moving the carton under

the folder, said folder being provided with a foot and a curved wall for closing two more of the flaps, and means for closing the remaining flap when the carton is moved in another direction.

8. In a packing machine, a recessed guide block, a slide thereon, a finger pivotally secured to the slide with its tail normally resting in said recess, a folder provided with a curved, longitudinal slot, whereby a foot is formed and a curved wall that overhangs the point of the foot, said finger and folder being adapted to close three flaps of a carton while the carton is moved under the folder by the slide, and means for closing the other flap when the carton is moved in another direction.

9. In a packing machine, means for closing three flaps of a carton when said carton is moved in one direction, a slide for moving the carton in another direction, a plunger carried by said slide, and a buttoner for closing the remaining flap after the carton has been moved in said other direction.

10. In a packing machine, means for closing three flaps of a carton when the carton is moved in one direction, a slide for moving the carton in another direction, a plunger thereon provided with a nose, and a buttoner for folding the remaining flap down over the nose and closing the carton as the nose is withdrawn.

11. In a packing machine, means for closing three flaps of a carton when the carton is moved in one direction, a slide for moving the carton in another direction, a plunger thereon provided with a nose, a standard having a recessed bottom for said nose, and plungers in the standard for closing and locking the remaining flap.

12. In a packing machine, a buttoner comprising a standard, recessed plungers therein provided with projections for causing the locking pieces of the outside flap to enter the slots in the first inner flap, and a foot for flattening the outside flap.

13. In a packing machine, a buttoner comprising a standard, two plungers and a supplemental plunger therein, one of the plungers being provided with a foot and the other plunger and the supplemental plunger being each provided with projections upon opposite sides of foot, and means for reciprocating the plungers.

14. In a packing machine, a buttoner comprising a standard, two slotted plungers and a shouldered supplemental plunger therein one of the plungers and the supplemental plunger being each provided with projections and the other plunger with a foot, pins in the standard for engaging with the shoulders of the supplemental plunger, pins in the projections of the plunger for springs between one of the plungers and the supplemental plunger, and rock shaft, each provided with an arm for engaging with the slotted portion of one of the plungers.

In testimony whereof I have affixed my signature, in presence of two witnesses, this thirteenth day of November 1905.

JAMES ALFRED GRAY.

Witnesses:
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F. M. BARTEL.