April 13, 1926. 1,580,498

L. L. KNOX ET AL

PORTIONING MACHINE

Original Filed May 27, 1922 5 Sheets-Sheet 1

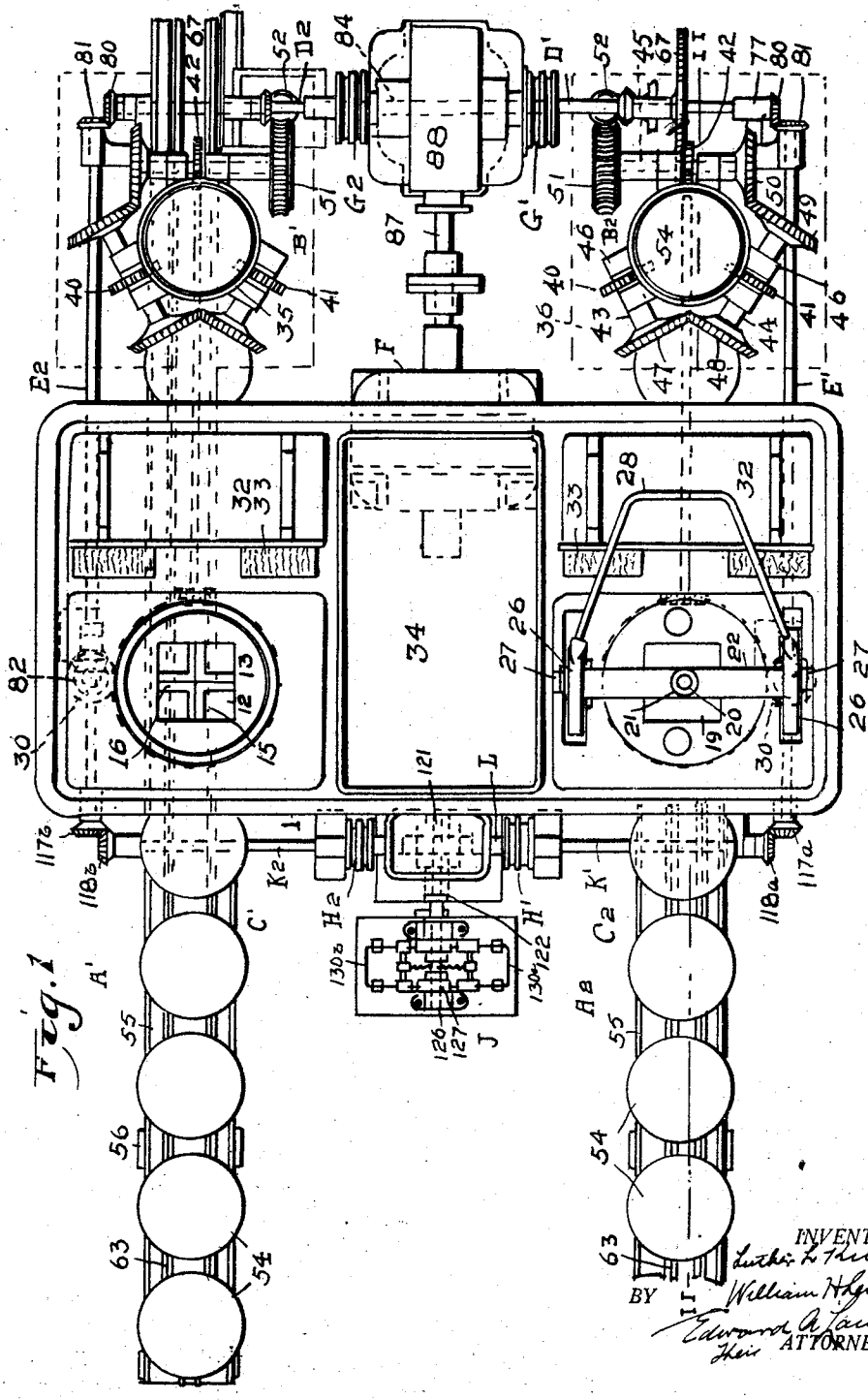


Fig. 1

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PORTIONING MACHINE

Original Filed May 27, 1922 5 Sheets-Sheet 2

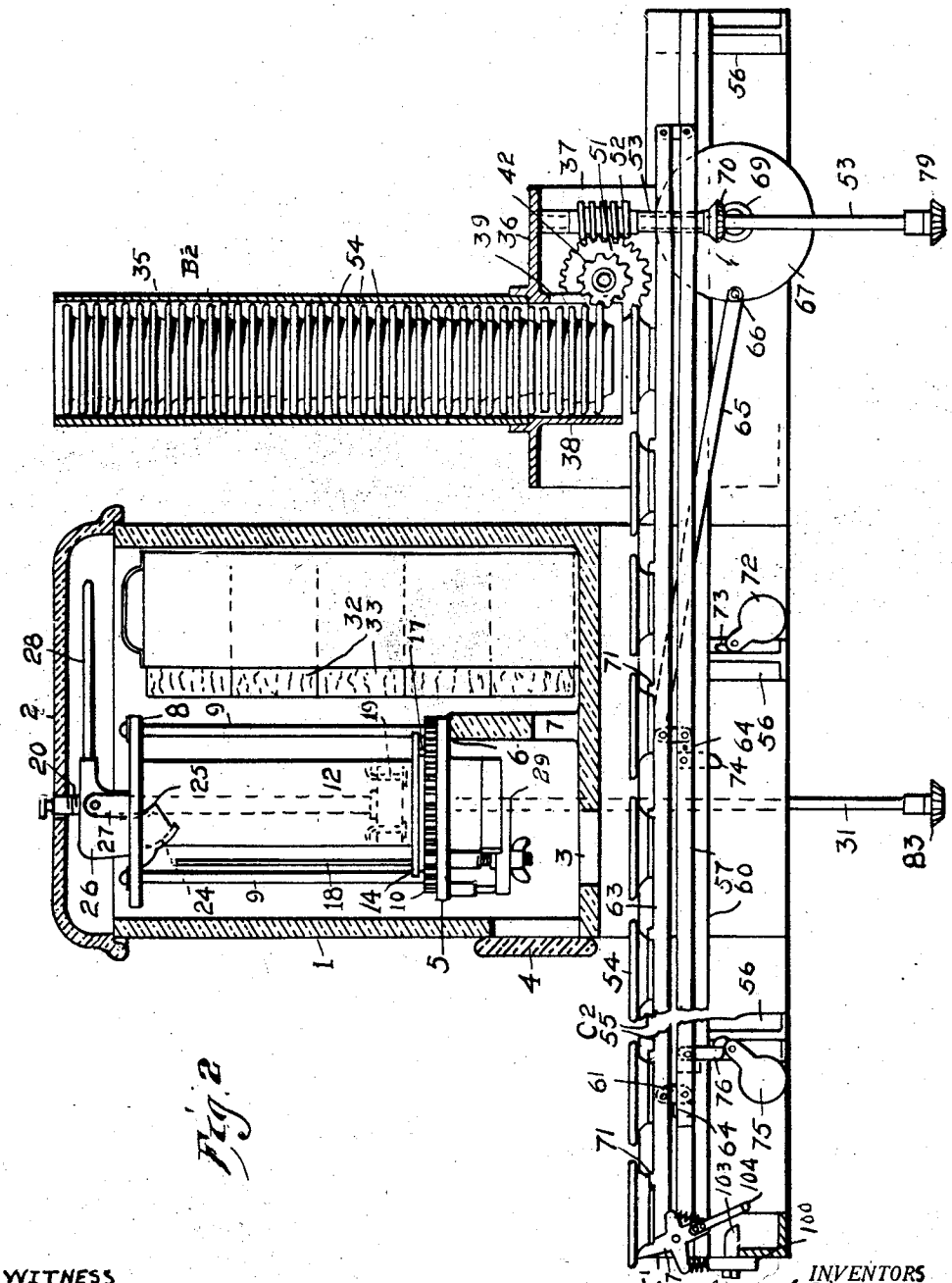


Fig. 2

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April 13, 1926. 1,580,498

L. L. KNOX ET AL

PORTIONING MACHINE

Original Filed May 27, 1922 5 Sheets-Sheet 3

Fig 3

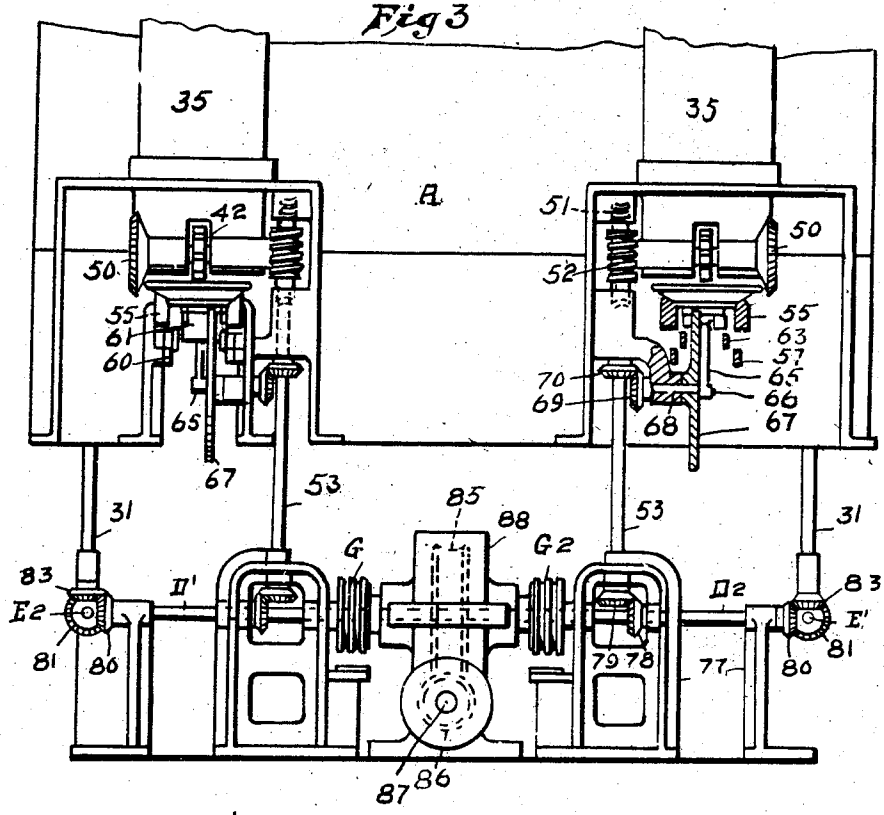
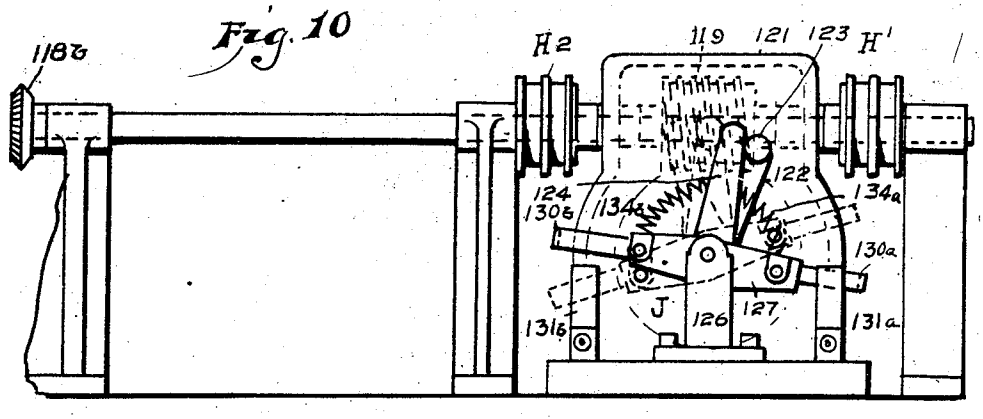


Fig. 10



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L. L. KNOX ET AL

PORTIONING MACHINE

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Fig 4

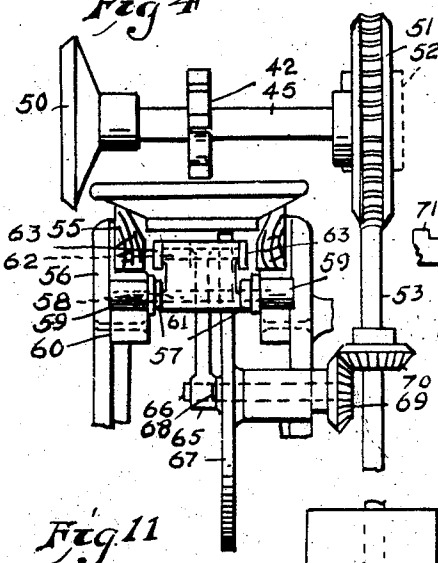


Fig 5

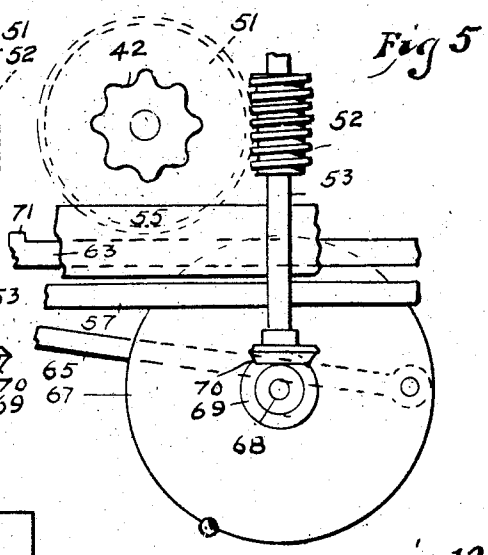


Fig 11

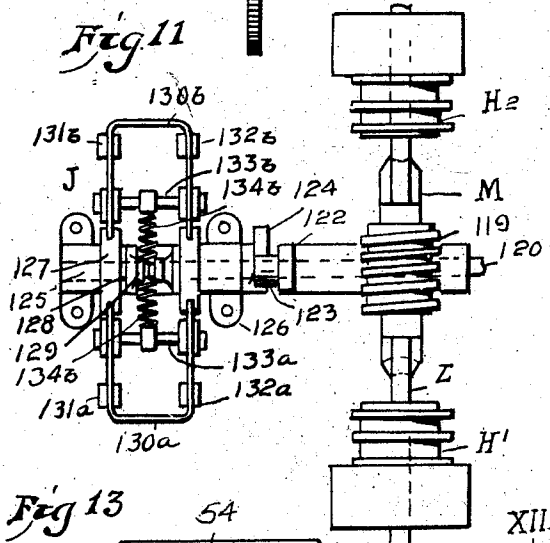


Fig 12

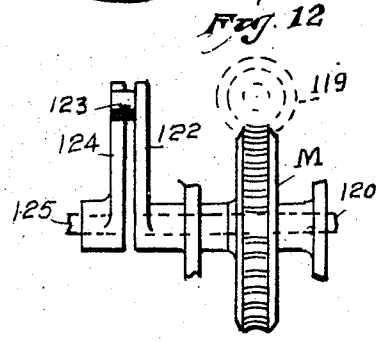


Fig 13

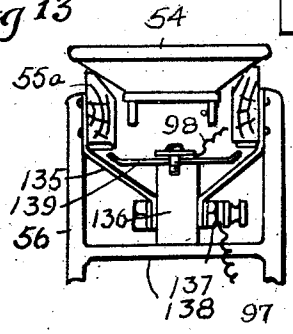
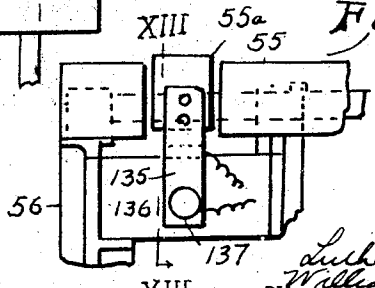


Fig 14



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April 13, 1926. 1,580,498

L. L. KNOX ET AL

PORTIONING MACHINE

Original Filed May 27, 1922 5 Sheets-Sheet 5

Fig. 6

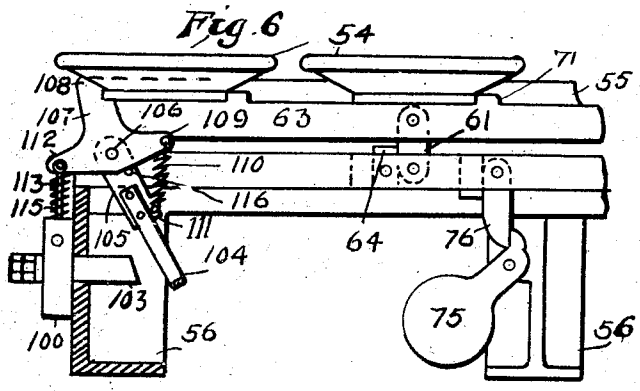


Fig. 7

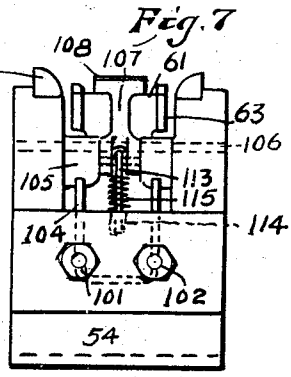
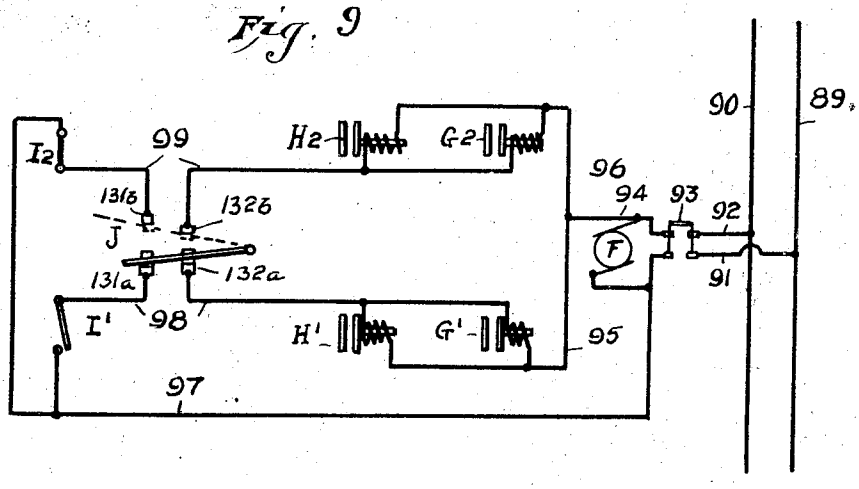


Fig. 8



Fig. 9



WITNESS
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Patented Apr. 13, 1926. 1,580,498

UNITED STATES PATENT OFFICE.

LUTHER L. KNOX, OF BELLEVUE, AND WILLIAM H. LEWIS, OF PITTSBURGH, PENNSYLVANIA.

PORTIONING MACHINE.

Application filed May 27, 1922, Serial No. 564,117. Renewed September 17, 1925.

To all whom it may concern:

Be it known that we, LUTHER L. KNOX and WILLIAM H. LEWIS, citizens of the United States, and residing, respectively, in the borough of Bellevue and city of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented or discovered the new, useful, and Improved Portioning Machine, of which the following is a specification.

Our invention consists in certain new and useful improvements in portioning machines intended for dispensing individual portions of butter or other substances.

The particular object which we have in view is the adaptation of such machines to automatic action whereby they may be used in connection with cafeteria or self-service restaurants, and the removal of a portion from the dispensing position will actuate the machine so that another portion will be presented in such dispensing position.

For the accomplishment of this purpose we have devised a machine characterized by coacting portion forming mechanisms and portion delivery mechanisms, so arranged that the removal of a portion presented by the delivery mechanism will actuate the portion forming mechanism to produce a fresh portion and deposit it on the delivery mechanism and the portion delivery mechanism to present a fresh portion at the point of delivery.

Thus we show apparatus comprising means for forming the individual portions; for supplying the empty butter plates to receive the portions so formed and delivery means which present the loaded plates for consumption, all of said means being so interrelated and actuated, that a removal of the loaded plate from the delivery position will cause another loaded plate to be advanced into its place while another portion is formed by the portioning means and an empty plate supplied to receive the same.

We prefer to make the machine in multiple form, so that when one side of the machine or set of coacting mechanisms have been exhausted, another set is automatically put into operation, giving an opportunity for refilling the first set, which will in turn be brought into operation when the second set is exhausted; thus alternate operation being continued indefinitely.

For the purpose of effecting the alternate or successive operation of the sides or sets of apparatus comprising the machine we have invented a new electric switch.

Other novel features of construction and arrangement of parts will appear from the following description.

In the accompanying drawings, which are however merely intended to illustrate the principles of our invention without limiting the scope of the same to the construction shown, Fig. 1 is an incomplete plan view of a portioning machine embodying the principles; Fig. 2 is a section, taken along line II—II in Fig. 1 of the machine with certain parts omitted; Fig. 3 is a rear end of the machine, partly sectioned to more clearly show the construction; Fig. 4 is an enlarged detail looking from the rear of the machine and showing the construction of the delivery mechanism; Fig. 5 is a side view of the same; Fig. 6 is a broken enlarged longitudinal section showing the front end of one of the dispensing mechanisms; Fig. 7 is a front view of the same; Fig. 8 is an enlarged detail showing the mounting of the ring gear of one of the portioning machines on the bottom casting; Fig. 9 is a diagrammatic view of the wiring circuits; Fig. 10 is an enlarged incomplete front elevation showing the automatic reversing mechanism for the duplex machine; Fig. 11 is a detail in plan view of the same; Fig. 12 is a detail showing the timing gear and crank; Fig. 13 is a section taken along the line XIII—XIII in Fig. 14, and Fig. 14 is a broken side elevation showing a modified form of automatic switch at the outer end of the dispensing mechanism.

In the drawings, wherein we have illustrated a practical embodiment of the principles of our invention, we show a multiple machine comprised of two sets of mechanism, each set consisting of means for severing individual portions to form a bar or bars of butter; means for supplying empty butter plates to receive the portions discharged by the portion forming means, and means for delivering the filled plates in turn to the dispensing position, the operation of all of said means being synchronized and controlled, so that the removal of the filled butter plate from the dispensing position actuates all of said means; and the two sets

of mechanisms being so interrelated that when a set or side of the machine has been emptied, the other set or side of the machine is automatically put into operation.

Each set or side of the machine is comprised of three main elements or mechanisms, a portioning mechanism, a butter plate supply mechanism, and a dispensing mechanism which spots the empty butter plates in turn to receive the severed portions and presents the filled plates in turn at the dispensing portion.

Thus in Fig. 1, one side of the machine is composed of the portioning mechanism A′, the butter plate supplying mechanism or stack B′ and the dispensing mechanism C, while the other side of the machine comprises the corresponding mechanisms A^2, B^2 and C^2.

We will first describe the butter portion mechanisms illustrated.

The form of portioning mechanism shown is the type of portioning mechanism which forms the subject matter of our patent application Serial Number 560,785, filed in the United States Patent Office on May 13, 1922, wherein the same is more fully shown and described.

Generally speaking the same is of the following character.

1 is a container which may conveniently be of porcelain or enameled iron or wood, having a removable lid or lids 2, a bottom discharge opening 3, and an access opening in its front closed by the vertical sliding door 4.

In the duplex machine shown in the drawings the two containers 1 of the two portioning mechanisms A′ and A^2 are integral with a space between them for the refrigerant tank.

5 is a bottom casting horizontally supported in the bottom of the container, as on horizontal ledges 6 and the top of cross partition 7. 8 is a top casting supported from the bottom casting, as by the vertical standards 9. The bottom and top castings are provided with alined circular openings. 10 is a ring gear provided with radial teeth, and which is rotatably mounted on the bottom casting 5, as by being journaled on the annular lip 11 of said casting surrounding the circular aperture therein.

12 is the dispensing tube shown as of square cross sectional shape, but which may be of any cross sectional shape desired. The upper end of said tube is fixed, as by soldering, in the correspondingly shaped axial opening in the circular plate 13 which rotates in the annular opening in the top casting 8, while the lower end of said tube extends through and is fixed, as by soldering, in a correspondingly shaped axial opening in a plate 14 which is mounted on the ring gear 10. To the lower end of the tube 12 is fixed the splitter member 15 by means of which the lower end of the bar of butter, as it is extruded from the tube, is split or divided longitudinally into a plurality of bars or rods of less cross sectional size. Thus in the case of a square dispensing tube, the splitter may be provided with a cruciform internal partition 16 whose top is formed of knife edges, thus splitting the protruded end of the bar of butter into four smaller bars.

When the dispensing tube 12 is mounted in the portioning machine, the plate 14 rests on the gear 10, being held in proper relation thereto by the dowel pin 17 depending from the plate 14 into a suitable socket in the gear 10, and also by the vertically disposed rod 18 fixed in the gear 10 and which extends upwardly through a vertically disposed hole in the plate 14. Said rod acts as a guide for the insertion and proper positioning of the dispensing tube and the parts attached thereto. It is evident that the dispensing tube and its associated parts will rotate with the gear 10.

19 is the piston fitting in the tube 12 and rotating therewith, said piston being fixed on the lower end of a screw shaft 20 which is screwed through a threaded bore 21 in a bar 22 which is disposed above the tube and diametrically of the axis of the latter. The ends of the bar 22 are down-turned and provided with the outwardly extending trunnions 23 which seat between the concentric flanges 24 and 25 of the cam plates 26 which are pivotally mounted eccentrically of their flanges on standards 27 extending upwardly from the top casting 8. The cam plates are provided with a connecting bail or V-shaped handle 28 by means of which the cam plates may be swung in unison to raise or lower the piston in the tube, or to permit the insertion of the trunnions between said flanges 24 and 25, or the removal of the trunnions therefrom. After the bar or bars of butter are inserted into the tube, the piston is let down on top of the butter and the trunnions are inserted between the flanges of the elevated cam plates. The cam plates are then swung to force the piston downwardly on the butter, thus properly compacting the same in the tube, the capacity of the splitter orifices, or that of the discharge end of the tube where no splitter is used, being reduced below the normal cross sectional capacity of the tube to provide the necessary resistance to effect such compacting. Such preliminary compacting is desirable to insure uniformity in the thickness of the severed portions.

Below the splitter member is located the portion slicing member 29 which may be a wire stretched tautly and radially of the axis of the splitter.

It is evident that the rotation of the gear

10 will cause the butter to be extruded below the splitter in the form of four small bars, the ends of which will be sliced off in turn to form individual portions which will successively drop down through the discharge aperture 3 in the floor of the container 1. Therefore a quarter rotation of the gear 10 will produce and discharge an individual portion.

The gear 10 is driven by a pinion 30 in the upper end of an intermittently driven shaft 31 vertically journaled in the frame of the machine.

We, of course, do not limit ourselves to the use of the type of portioning mechanism illustrated, inasmuch as any type of portioning mechanism which will produce the severed portions as required, may be provided, but the type illustrated is preferred because of its many advantages.

In the rear portion of the container 1 may be placed the cans 32 for the extra supply of butter bars 33 which are shown stored in a horizontal position with their ends protruding from the open front of the cans 32.

In the case of the duplex machine illustrated in the drawings between the casings 1 of the two portioning machines A′ and A² is the removable tank 34 for ice and salt, or other refrigerants.

In the rear of each portion forming mechanism is a butter plate supply mechanism B′ or B². The same is shown as of the following construction.

35 is a vertically disposed tube supported by the platform 36 which is in turn supported by the vertically disposed leg plates 37. The platform is provided with an aperture registering with the bore of the tube 35 and below which depends the bottom tube 38 which is in effect a continuation of the tube 35. The walls of the tube 38 are provided with three equal spaced apart vertically disposed slots 39 into which project the cog wheels 40, 41 and 42 rigidly mounted on the shafts 43, 44 and 45, respectively, said shafts being horizontally journaled in sleeve bearings 46 secured to the tube. One end of the shaft 43 is provided with a beveled gear 47 which meshes with a beveled gear 48 on the end of the shaft 44 while a similar beveled gear 49 on the other end of the shaft 44 meshes with a like gear 50 on the shaft 45. The other end of the shaft 45 is provided with a worm gear 51 which meshes with a worm 52 on the upper end of a driven shaft 53 vertically journaled in the frame. Thus the cog wheels 40, 41 and 42 rotate in unison and at the same speed.

The butter plates 54 fit in the tube 35 and are stacked in the tubes 35 and 38, the bottom plate of the stack being supported by the teeth of the three cog wheels 40, 41 and 42, the cogs or teeth of the latter being designed and spaced so that when the cogs are turned a distance equal to that between adjacent teeth centers, the bottom plate is dropped down through the tube 38 and the stack of plates settles until the next plate above is caught and supported by the cogs.

We provide means whereby the butter plates as they are dropped in turn from the stack mechanism, B′ or B², are received and in turn spotted under the discharge opening 3 of the portioning mechanism, A′ or A², to be loaded, and are then advanced to the dispensing position. One of such means is provided for each side of the machine and designated as C′ or C², and shown as of the following construction.

55 represents a pair of parallel, horizontally disposed rails which are preferably of wood and supported by the legs 56. Said rails extend from beneath the plate stack mechanism and the portion forming mechanism to the front of the machine, and have their adjacent faces beveled, as shown, so that the butter plates are properly supported thereon.

57 represents a pair of horizontally disposed slide bars which are mounted in spaced relation on the axles 58 whose outer ends are provided with rollers 59 running on the track rails 60 bolted to the inner sides of the legs 56 below the rails 55. 61 are links whose lower ends are pivotally mounted on the axles 58 between the bars 57 thus spacing said bars apart. The upper ends of said links have pivotally attached by the shafts 62 to their opposite ends the pair of pick-up bars 63 which may be raised or lowered in relation to the slide bars 57 by swinging the links 61. Stops 64 carried by the bars 57 prevent the links 60 from swinging forwardly beyond their vertical positions, so that the pick-up bars 63 may be moved forwardly and upwardly, and rearwardly and downwardly relative to the slide bars 57. The intermediate link 61 is recessed at its upper end to permit the pitman rod 65 to be pivoted to the corresponding shaft 62. The rear end of the pitman rod 65 is pivotally connected to the wrist pin 66 eccentrically mounted on the outer face of the disk 67 rigidly mounted on a horizontally journaled shaft 68 whose other end is provided with a beveled gear 69 meshing with a similar gear 70 on the driven shaft 53.

It is evident that the rotation of the disk 67 will alternately raise the pick-up bars 63 and then advance the same in unison with the slide bars 57, and depress the pick-up bars and then cause them to retreat in unison with slide bars. The bars 63 are provided with upwardly extending projections or studs 71 having their centers spaced apart a distance equal to the distance of movement of the slide bars, said projections being intended to engage from the rear the butter plates on the rails 55, so that said plates may

be lifted by the pick-up bars and moved forwardly. To insure the pick-up bars being elevated before they are advanced, we provide a weigh 72 eccentrically pivoted to one of the legs 56, and having an upwardly extending projection 73 which is in the path of the finger 74 depending from one of the slide bars 57 and pivoted to swing out of the vertical towards the front of the machine only. Thus when power is applied to force the bars 63 forwardly, the weight retards the movement of the slide bars until the pick-up bars have been raised to pick up the plates and sufficient force is exerted by the links 61 against the stops 64 to cause the finger 74 to force the weight aside. During the retreat of the slide bars the finger 74 trails idly over the projection 73. To cause the pick-up bars to be first depressed to deposit the plates on the rails 55 before the slide bars are moved rearwardly we provide a similar weight 75 and striking finger 76 which operate in the reverse direction.

D′ and D² represent the two alined driving shafts horizontally journaled transversely of the machine in housings 77 and each provided with a beveled gear 78 meshing with a beveled gear 79 on the lower end of the shaft 53. The outer ends of the shaft D′ and D² are each provided with a beveled gear 80 meshing with a similar gear 81 on the rear end of a horizontally disposed shaft E′ or E², running to the front of the machine and each provided with a beveled gear 82 which meshes with a similar gear 83 on the lower end of the shafts 31.

The gear ratios and assemblage is such that each time the mechanisms are actuated the butter plates 54 are each moved forward along the rails 55 one space, a new butter plate is dropped from the tube 38 onto the rails 55, and a portion of butter is severed and dropped onto the butter plate now moved up and spotted under the discharge orifice 3 of the portioning mechanism.

The driving shafts D′ and D² are operatively connected through clutches to the motor F, and the feed circuit of said motor has provided therein a circuit breaker at the front end of each of the dispensing means C′ and C² which is held open by the butter plate spotted in the dispensing position at the front end of the rails 55. When said front butter plate is removed by a patron or employee of the restaurant, the motor circuit is automatically closed, actuating the mechanism which continues to operate until a butter plate is again moved up into the dispensing position at the front end of the rails, when the circuit is broken. The motor circuit and its automatic control will be later explained.

The shafts D′ and D², are axially alined on either side of a worm shaft 84 to the opposite ends of which the shafts D′ and D² are coupled by the magnetic clutches G′ and G², respectively. The shaft 84 is provided with a worm 85 which meshes with a worm 86 on the shaft 87 of the motor F, said gearing being provided with a housing 88.

The motor circuit is illustrated diagrammatically in Fig. 9. Thus the feed wires 89 and 90 are connected by branch wires 91 and 92 respectively, to the motor F, a double pole switch 93 being interposed in said motor circuit so as to cut out the machine entirely when desired. To one of the wires of the branch circuit, as for instance the wire 92, is connected the wire 94 having two branches 95 and 96 connected respectively to the magnetic clutches G′ and G², and also connected respectively to the second pair of magnetic clutches H′ and H². 97 is a conductor connecting the branch wire 91 to the poles of the two single pole switches I′ and I². The other side of the switch I′ is connected by a conductor 98 with the magnetic clutches H′ and G′, while a conductor 99 connects the other side of the switch I² with the magnetic clutches H² and G². J is a double pole timing switch interposed in the conductors 98 and 99 and adapted when thrown in one direction to complete the conductor 98 and when thrown in the opposite direction to complete the conductor 99.

Thus, when the switch J is thrown into the position shown in Figs. 9 and 10, to complete the conductor 98, and the switch I′ is closed, the magnetic clutch G′ is actuated to couple the driving shaft D′ with the motor F and the corresponding side A′, B′ and C′ of the multiple machine is operative, while the side A², B² and C² is cut out. On the contrary, when the switch J is thrown into its other position, completing the conductor 99, and the switch I² is closed, then the magnetic clutch G² couples the driving shaft D² to the motor F and the side A², B² and C² of the machine is operative and the side A′, B′ and C′ is cut out.

The single pole switches I′ and I² are each mounted on the outer end of one of the dispensing mechanisms, C′ or C², and are thrown out by the outermost of the butter plates on the rails 55. The construction of these switches is shown in detail in Figs. 6 and 7. Thus mounted on the front rail support 56 is the block 100 of fibre or other insulating material in which are mounted the two posts 101 and 102 to which the ends of the conductors 97 and 98, or 97 and 99, as the case may be, are respectively connected. Mounted on the inner protruding ends of the posts 101 and 102 are two spring fork contacts 103. 104 is a brass U-shape bridge bar adapted to engage the contacts 103 and electrically connect the same. The upwardly extending legs of said bridge bar 104 are secured to a pair of fibre or other insulating blocks 105 which are pivotally mounted

in spaced relation on a shaft 106 extending between the legs 56. Pivotally mounted on said shaft between said blocks is the metal throwing lever 107 having an integral, upwardly extending finger 108 and a toe 109. The toe is connected by a helical spring 110 with a cross brace 111 connecting the two blocks 105. Opposite the toe 109 the lever 107 is provided with two parallel vertical flanges 112 between which is pivotally pinned the upper end of the rod 113 whose lower end depends in a loosely fitting guide socket 114 in the block 100. A helical spring 115 is coiled about said rod 113 between the flanges 112 and the block 100.

The adjacent faces of the blocks 105 are provided with stop pins 116 which are engaged by the lever 107 when it swings counter-clockwise in Fig. 6.

It is evident that when free from interference the spring 115 will throw said lever 107 clockwise in Fig. 6, and by the engagement of the lever with the stop pins 116 on the blocks 105, force the bridge bar 104 into engagement with the spring contacts 103. In such case, assuming the double pole switch J to be thrown to complete the circuit of the magnetic clutch G′ or G², as the case may be, the corresponding driving shaft, D′ or D², will be coupled to the motor F and the portioning mechanism, the plate supply mechanism and the dispensing mechanism on that side of the machine will be put into operation and will continue in operation until the single pole switch I′ or I², as the case may be, is thrown open.

When a butter plate moves into the dispensing position at the extreme front of the machine, as shown in Fig. 6, the front edge of the plate will engage the finger 108 of the lever 107 and throw said lever into the position shown, the lever first swinging without moving the bridge bar 104 until the tension of the expansion of the spring 110 will be sufficient to overcome the grip of the spring contacts 103, thus suddenly and completely opening the switch and thereby stopping the mechanism. When the front butter plate is removed, the spring 115 again causes the switch to close and causes the machine to operate until a fresh butter plate assumes the front or dispensing position. It is evident that the removal of the front butter plate only will start the machine, but the dispensing mechanism preferably protrudes far enough in front of the portioning mechanism to expose a number of loaded plates; but all of said plates, except the front plate, may be removed without starting the machine.

It is also evident that when the switch J is thrown into the position indicated in Fig. 10, the side of the machine A′, B′ and C′ is operatable, while the side of the machine A², B² and C² is inoperative, but the last named side may be rendered operative and the first named side inoperative by throwing the switch J into the other position.

We provide automatic means whereby when the one side of the machine has been theoretically emptied, that side of the machine is cut out and the other side thrown into service. Then the first named side may be refilled with butter and plates, so that when second named side of the machine is emptied, the first named side, having been refilled, is ready to be automatically thrown into operation. This alternate operation of the two sides of the machine may be continued indefinitely.

Thus the horizontally disposed line shafts E′ and E² at either side of the machine, which deliver power to the portioning mechanisms A′ and A² respectively, are extended forwardly and provided at their front end with beveled gears 117ᵃ and 117ᵇ which mesh respectively with similar gears 118ᵃ and 118ᵇ on the outer ends of the two alined shafts K′ and K², respectively. Between the spaced apart shafts K′ and K² is the shaft L journaled in suitable housings and whose ends may be connected to the ends of the shafts K′ and K² by the magnetic clutches H′ and H², respectively. Thus the shaft L is rotated in one direction, or the other, in accordance with which of the clutches H′ or H² is engaged, inasmuch as the shafts E′ and E² rotate in opposite directions.

The shaft L is provided with a worm 119 which meshes with a relatively large timing worm gear M mounted on a shaft 120 horizontally journaled in suitable housings 121 axially of the machine.

The other end of the shaft 120 is provided with a radial crank 122 on whose outer end is the crank pin 123.

124 is a radial arm on the adjacent end of a shaft 125 journaled in suitable standard housings 126, and alined with the shaft 120. 127 represents a pair of rocking bars of insulating material which are loosely mounted on the shaft 125 between the housings 126. Between the bars 127 a hub 128 is fixed on said shaft 125 and said hub is provided with a radially disposed duplex arm 129. 130ᵃ and 130ᵇ are U-shaped bridge bars of brass whose legs are connected to the ends of the bars 127 and which are adapted to electrically connect the bifurcated spring contact members 131ᵃ and 132ᵃ or 131ᵇ and 132ᵇ, in accordance with which bridge bar 130ᵃ or 130ᵇ is connecting up its conductor, The contacts 131ᵃ and 132ᵃ are interposed in the conductor 98 and the contacts 131ᵇ and 132ᵇ in the conductor 99 as shown in Fig. 9. The U-shaped contact bars 130ᵃ and 130ᵇ are each provided with a cross bar 133ᵃ or 133ᵇ,

which are connected with the outer end of the duplex arm 129 by helical springs 134ª and 134ᵇ respectively.

Thus when the switch J is thrown in the position illustrated in Figs. 9 and 10, the side of the machine A′, B′ and C′ is electrically connected up and ready for operation and the side A², B², and C², cut out, and when the switch J is thrown into its opposite position side A′, B′ and C′ is cut out and side A², B² and C² is connected up.

When the switch is in the position shown full lines in Fig. 10, the magnetic clutch H′ is engaged and the clutch H² disengaged, and therefore the shaft is rotated in the predetermined direction, thus rotating the time gear M which starts the crank 122 to turn counter-clockwise in Fig. 10, the movement of said crank causing the pin 123 to travel around and finally pick up the arm 124 of the shaft 125, turning said arm from its position shown in full lines to its position indicated in dotted lines in Fig. 10. The rotation of said shaft, and with it the arm 129 which will first put tension on the right hand spring 131ª and finally through said spring will pull the bridge bar 132ª out of engagement with the contacts 133ª and 134ª while at the same time the compression of the opposite spring 131ᵇ will force the bridge bar 132ᵇ into engagement with the contacts 133ᵇ and 134ᵇ, thus interrupting the conductor 98 and thus cutting out the A′, B′ and C′ side of the machine and completing the conductor 99 and connecting up the A², B² and C² side of the machine.

It is evident that the interruption of the conductor 98 will disengage the clutch H′ while the completion of the conductor 99 will engage the clutch H², thus reversing the movement of the shaft L and with it the crank, so that it will travel in the reverse, or clockwise direction, from its position shown in dotted lines to its position shown in full lines and in time throw the switch back once more into the position shown in full lines, thus cutting out side A², B² and C² of the machine and connecting up side A′, B′ and C′.

Thus every time the crank 122 completes a movement, one side of the machine is cut out and the other side connected up. The relative size of the time gear M and the throw of the crank 122 is such that each side of the machine is in operative condition until the butter is exhausted from its dispensing mechanism, whereupon that side of the machine is cut out and the other side put into operation, the first named side being then replenished with butter and butter plates.

In Figs. 13 and 14 we show a modified form of make and break device for the front end of the dispensing mechanisms, to be used as a substitute for the switches I′ and I². Thus we show the rails 55 interrupted near their outer ends to permit the insertion of the floating rail sections 55ª which are individually supported by the angular spring arms 135 which are in turn mounted on the insulating block 136 by the binding bolt 137 which may be electrically connected to the conductor 97. The block 136 may be supported by a cross bar 138 between the legs 56. 139 is a bridge bar mounted on top of the block 136 and electrically connected to the conductor 98 or 99, as the case may be. When no butter plate is spotted on the floating rails 55ª, the said rails are elevated slightly above the permanent rails 55 and the spring arms 135 are in electrical contact with the ends of the bridge bar 139, completing the circuits of the corresponding magnetic clutches. When a loaded butter plate is spotted on the rails 55ª the same are depressed, as shown in Figs. 13 and 14, thus spreading the arms 135 and breaking their contact with the bridge bar 139, thus interrupting the circuit. When the floating rails are depressed the butter plate may be partially supported by the permanent rails, so that accidental pressure downwardly on the butter plate will be taken off the floating rails and assumed by the fixed rails.

It is evident from the foregoing that our invention is especially adapted to self-service or quick service restaurants where the supply of portions must be maintained. Contact of the portions with the hands is avoided, and the portions are supplied as needed, the rate of dispensing increasing or decreasing with the demand.

The plate stack or supply means is positive in its action, a fresh plate being presented to the portioning mechanism for the reception of each portion produced. It is preferable that the removal of the loaded plate presented at the front or forward position actuates the machine, thereby causing the removal of the portions in proper order. Of course, it is not necessary for the next person to wait until a second plate is advanced into the front position before removing the same, but the machine illustrated will be put into operation only by the removal of the front plate, and once in operation, will continue in operation until a plate is advanced into the front position.

By embodying the principles of our invention in a duplex or multiple machine, the same need not go out of service for refilling, since when one side or portion of the machine has been emptied, this side is automatically cut out and the other side put into operation while the first mentioned side is refilled; such alternate operation and refilling being continued indefinitely. We have shown a duplex machine, but it will be understood that any number of sets of mechanisms may be provided, said sets being auto-

matically thrown into operation and then cut out for refilling when empty.

Although, for the sake of clearness, we have described in detail the embodiment of the principles of our invention illustrated in the drawings, we do not wish to limit ourselves thereby, but claim broadly:—

1. In a machine for forming and dispensing individual portions of butter and similar substances, the combination of a vertically disposed dispensing tube adapted to contain a bar of the product to be portioned, mechanism for causing the lower end of said bar to be extruded and the extruded portion of said bar to be sliced off to form portions, mechanism for presenting empty containers in position to receive the sliced-off portions and for moving the loaded containers into a dispensing position, and means whereby the removal of a loaded container from the dispensing position causes all of said mechanisms to be put into operation.

2. In a machine for forming and dispensing individual portions of butter and similar substances, the combination of a vertically disposed dispensing tube adapted to contain a bar of the product to be portioned, mechanism for causing the lower end of said bar to be extruded and the extruded portion of said bar to be sliced off to form portions, mechanism for presenting empty containers in position to receive the sliced-off portions and for moving the loaded containers into a dispensing position, means whereby the removal of a loaded container from the dispensing position automatically causes all of said mechanisms to be put into operation, and means whereby the subsequent arrival of a loaded container in the dispensing position causes said mechanisms to cease operation.

3. In a machine for forming and dispensing individual portions, the combination of portion forming mechanism, mechanism for supplying empty containers to receive the portions as they are discharged by the portion forming mechanism, mechanism for presenting the loaded containers in the dispensing position, and means whereby the removal of a container from the dispensing position automatically actuates all of said mechanisms.

4. In a machine for forming and dispensing individual portions, the combination of portion forming mechanism, mechanism for supplying empty containers to receive the portions as they are discharged by the portion forming mechanism, mechanism for presenting the loaded containers in the dispensing position, means whereby the removal of a container from the dispensing position automatically actuates all of said mechanism, and means whereby the presentation of another container in the dispensing position halts said mechanisms.

5. In a machine for forming and dispensing individual portions, the combination of portion forming mechanism, mechanism for supplying empty containers to receive the portions as they are discharged by the portion forming mechanism, mechanism for presenting the loaded containers in the dispensing position, a source of operative power, and means whereby the removal of a container from the dispensing position automatically couples said source of power to said mechanisms.

6. In a machine for forming and dispensing individual portions, the combination of portion forming mechanism, mechanism for supplying empty containers to receive the portions as they are discharged by the portion forming mechanism, mechanism for presenting the loaded containers in the dispensing position, a source of operative power, means whereby the removal of a container from the dispensing position automatically couples said source of power to said mechanisms, and means whereby the presentation of another container in the dispensing position automatically disconnects said source of power from said mechanisms.

7. In a machine for forming and dispensing individual portions, the combination of portion forming mechanism, mechanism for supplying empty containers to receive the portions as they are discharged by the portion forming mechanism, mechanism for presenting the loaded containers in turn in the dispensing position, and means whereby the removal of a container from the dispensing position automatically causes all of said mechanisms to be put into operation.

8. In a machine for forming and dispensing individual portions, the combination of portion forming mechanism, mechanism for supplying empty containers to receive the portions as they are discharged by the portion forming mechanism, mechanism for presenting the loaded containers in turn in the dispensing position, means whereby the removal of a container from the dispensing position automatically causes all of said mechanisms to be put into operation, and means whereby the presentation of another container in the dispensing position automatically causes the operation of said mechanisms to cease.

9. In a machine for forming and dispensing individual portions, the combination of portion forming mechanism, mechanism for supplying empty containers to receive the portions as they are discharged by the portion forming mechanism, mechanism for presenting the loaded containers in turn in the dispensing position, a source of operative power, and means whereby the removal of a container from the dispensing position automatically connects said mechanisms to said source of power.

10. In a machine for forming and dispensing individual portions, the combination of portion forming mechanism, mechanism for supplying empty containers to receive the portions as they are discharged by the portion forming mechanism, mechanism for presenting the loaded containers in turn in the dispensing position, a source of operative power, means whereby the removal of a container from the dispensing position automatically connects said mechanisms to said source of power, and means whereby the presentation of another container in the dispensing position automatically disconnects said mechanisms from said source of operative power.

11. In a machine for forming and dispensing individual portions, the combination of portion forming mechansm, mechanism for supplying empty containers to receive the portions as they are discharged by the portion forming mechanism, mechanism for presenting the loaded containers in turn in the dispensing position, a source of power, clutch mechanism adapted when engaged to connect said source of power to said mechanisms to operate the same, and means whereby the removal of a container from the dispensing position will cause said clutch mechanism to be automatically engaged.

12. In a machine for forming and dispensing individual portions, the combination of portion forming mechanism, mechanism for supplying empty containers to receive the portions as they are discharged by the portion forming mechanism, mechanism for presenting the loaded containers in turn in the dispensing position, a source of power, clutch mechanism adapted when engaged to connect said source of power to said mechanism to operate the same, means whereby the removal of a container from the dispensing position will cause said clutch mechanism to be automatically engaged, and means whereby the presentation of another container to the dispensing posistion will cause said clutch mechanism to be automatically disengaged.

13. In a machine for forming and dispensing individual portions, the combination of portion forming mechanism, mechanism for supplying empty containers to receive the portions as they are discharged by the portion forming mechanism, mechanism for presenting the loaded containers in turn in the dispensing position, a source of power, a magnetic clutch adapted to couple said source of power to said mechanisms to operate the latter, and a switch in the clutch circuit, and means whereby said switch is automatically thrown open by the presentation of a container in the dispensing position whereby said clutch is deenergized.

14. In a machine for forming and dispensing individual portions, the combination of portion forming mechanism, mechanism for supplying empty containers to receive the portions as they are discharged by the portion forming mechanism, mechanism for presenting the loaded containers in turn in the dispensing position, a source of power, a magnetic clutch adapted to couple said source of power to said mechanism to operate the latter, a switch in the clutch circuit, and means whereby said switch is automatically thrown open by the presentation of a container in the dispensing position whereby said clutch is deenergized, and means whereby said switch automatically closes and said clutch is energized when a container is removed from the dispensing position.

15. In a machine for forming and dispensing individual portions, the combination of portion forming mechanism, mechanism for supplying empty containers to receive the portions as they are discharged by the portion forming mechanism, mechanism for preventing the loaded containers in turn in the dispensing position, a source of power, a magnetic clutch adapted to operatively connect said mechanisms to said source of power, and means whereby said clutch is automatically maintained deenergized while a container occupies the dispensing position.

16. In a machine for forming and dispensing individual portions, the combination of portion forming mechanism, mechanism for supplying empty containers to receive the portions as they are discharged by the portion forming mechanism, mechanism for presenting the loaded containers in turn in the dispensing position, a source of power, a magnetic clutch adapted to operatively connect said mechanisms to said source of power, means whereby said clutch is automatically maintained deenergized while a container occupies the dispensing position, and means whereby when the container is removed from the dispensing position said clutch is automatically energized.

17. In a portion forming and dispensing machine, the combination of a plurality of sets of mechanisms, each set comprising mechanism for forming and dispensing portions, and automatically operating means whereby said sets are successively thrown into and out of operation for the purpose described.

18. In a portion forming and dispensing machine, the combination of a plurality of sets of mechanisms, each set comprising mechanism for forming and dispensing portions, a source of operative power, and means whereby at predetermined intervals one set is disconnected from said source of power and another set is connected to said source of power.

19. In a portion forming and dispensing machine, the combination of a plurality of

sets of mechanisms, each set comprising mechanism for forming and dispensing portions, a source of power, and means for connecting said sets of mechanisms in turn to said source of power.

20. In a portion forming and dispensing machine, the combination of a plurality of sets of mechanisms, each set comprising mechanism for forming and dispensing portions, a source of power, means for alternately connecting said sets of mechanisms to said source of power, and timing means controlling the action of said connecting means.

21. In a portion forming and dispensing machine, the combination of a plurality of sets of mechanisms for forming and dispensing portions, a source of power, means for connecting said sets of mechanisms in turn to said source of power, and timed mechanism for shifting said connecting means.

22. In a portion forming and dispensing machine, the combination of a plurality of sets of mechanisms for forming and dispensing portions, a source of power, shiftable means whereby said sets of mechanisms may be successively connected to said source of power, and automatic means for shifting said shiftable means at predetermined intervals.

23. In a portion forming and dispensing machine, the combination of a plurality of sets of mechanisms for forming and dispensing portions, and automatic means for successively throwing said sets into operation.

24. In a portion forming and dispensing machine, the combination of a plurality of sets of mechanisms for forming and dispensing portions, a source of operative power, and automatic means for successively connecting said sets of mechanisms to said source of power.

25. In a portion forming and dispensing machine, the combination of a plurality of sets of mechanisms for forming and dispensing portions, a source of power, a magnetic clutch for each set of mechanisms adapted when energized to operatively connect the corresponding set to the source of power, and an automatic switch adapted to energize said clutches successively for the purpose described.

26. In a portion forming and dispensing machine, the combination of a plurality of sets of mechanisms for forming and dispensing portions, a source of power, a magnetic clutch for each set of mechanisms adapted when energized to operatively connect the corresponding set to the source of power, an automatic switch adapted to energize said clutches successively for the purpose described, and timed means for throwing said switch.

27. In a portion forming and dispensing machine, the combination of a plurality of sets of mechanisms for forming and presenting the portions in the dispensing position, means associated with each set whereby when a portion is removed from the dispensing position the mechanisms of said set are actuated, and means whereby when a predetermined number of portions have been formed and dispensed by one of said sets, said set is automatically cut out of operation and another set is put into operation, for the purpose described.

28. In a portion forming and dispensing machine, the combination of a plurality of sets of mechanisms for forming and presenting portions in the dispensing position, means associated with each set whereby when a portion is removed from the dispensing position the mechanisms of the corresponding set are actuated, a source of power, a magnetic clutch for each set and adapted when energized to operatively connect said set to said source of power, and means whereby said magnetic clutches are successively energized so that said sets are put into operation successively for the purpose described.

29. In a portion forming and dispensing machine, the combination of a plurality of sets of mechanisms for forming and presenting portions in the dispensing position, means associated with each set whereby when a portion is removed from the dispensing position the mechanisms of the corresponding set is actuated, means whereby when another portion is presented in the dispensing position said mechanisms are halted, a source of power, a magnetic clutch for each set and adapted when energized to operatively connect said set with said source of power, and means whereby said magnetic clutches are successively energized so that said sets are put into operation successively for the purpose described.

30. In a portioning machine, the combination of a plurality of mechanisms for forming and dispensing portions, a source of power, means for connecting said mechanisms individually to said source of power, and means whereby said last mentioned means is controlled by the operation of each of said mechanisms whereby said mechanisms are successively put into operation and cut out of operation for the purpose described.

31. In a portioning machine, the combination of a plurality of mechanisms for forming and dispensing portions, a source of power, a magnetic clutch for each of said mechanisms and adapted when energized to operatively connect its mechanism with said source of power, and means controlled by the operation of said mechanism for deenergizing its clutch and energizing the clutch of another mechanism for the purpose described.

32. In a portioning machine, the combination of a plurality of mechanisms for forming and dispensing portions, a source of power, a magnetic clutch for each of said mechanisms and adapted when energized to operatively connect its mechanism with said source of power, means controlled by the operation of said mechanism for deenergizing its clutch, and means whereby when said clutch is deenergized the clutch of another mechanism is energized, for the purpose described.

Signed at Pittsburgh, Pa., this 22nd day of May, 1922.

LUTHER L. KNOX.
WILLIAM H. LEWIS.

Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,580,498, granted April 13, 1926, upon the application of Luther L. Knox, of Bellevue, and William H. Lewis, of Pittsburgh, Pennsylvania, for an improvement in "Portioning Machines," an error appears in the printed specification requiring correction as follows: Page 8, line 89, claim 15, for the word "preventing" read *presenting;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 18th day of May, A. D. 1926.

[SEAL.]

M. J. MOORE,
Acting Commissioner of Patents.