

Jan. 27, 1953

J. L. WHITSEL

2,626,575

SANDWICH-MAKING MACHINE

Filed Nov. 19, 1948

17 Sheets-Sheet 1

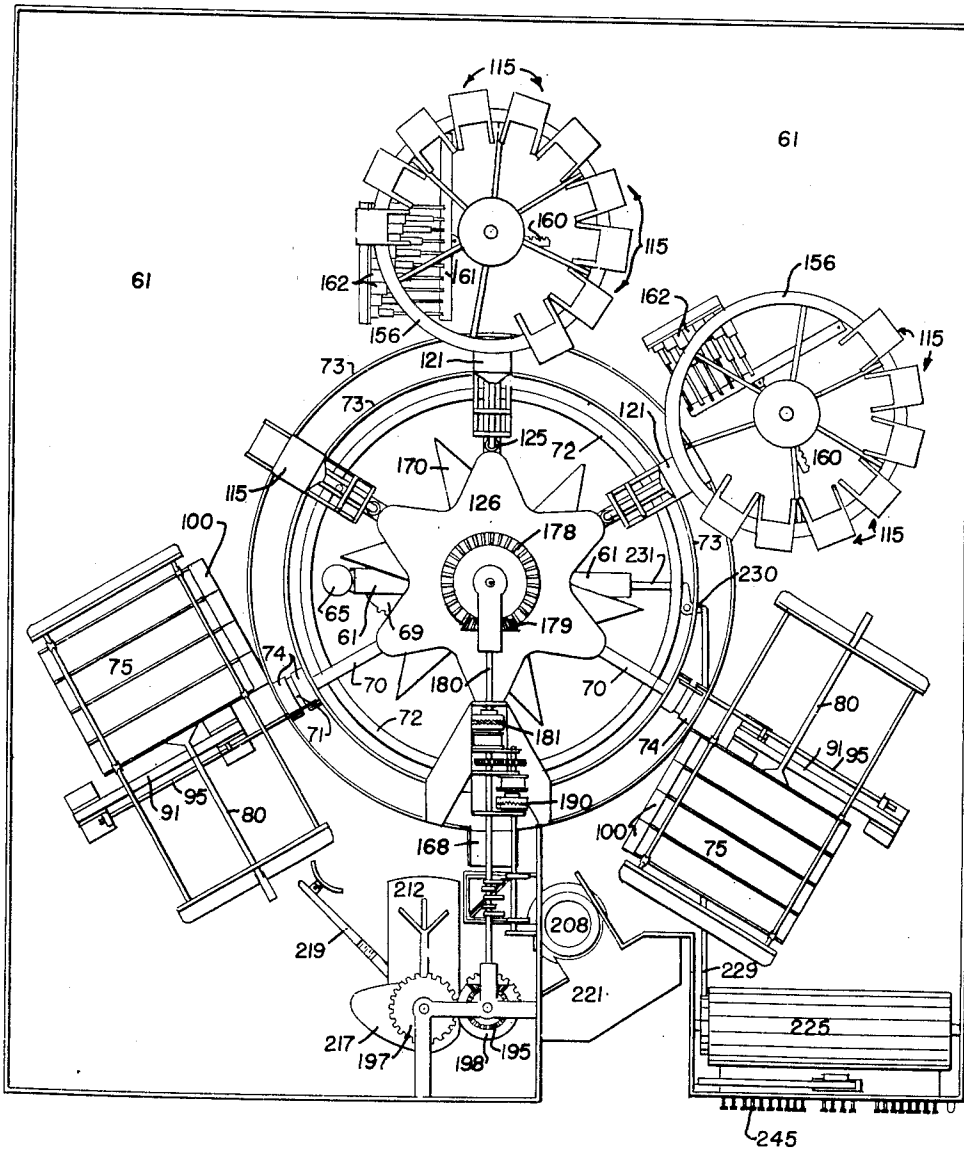


Fig. 1

INVENTOR.
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BY *Harold Sweet*
ATTORNEY

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17 Sheets-Sheet 2

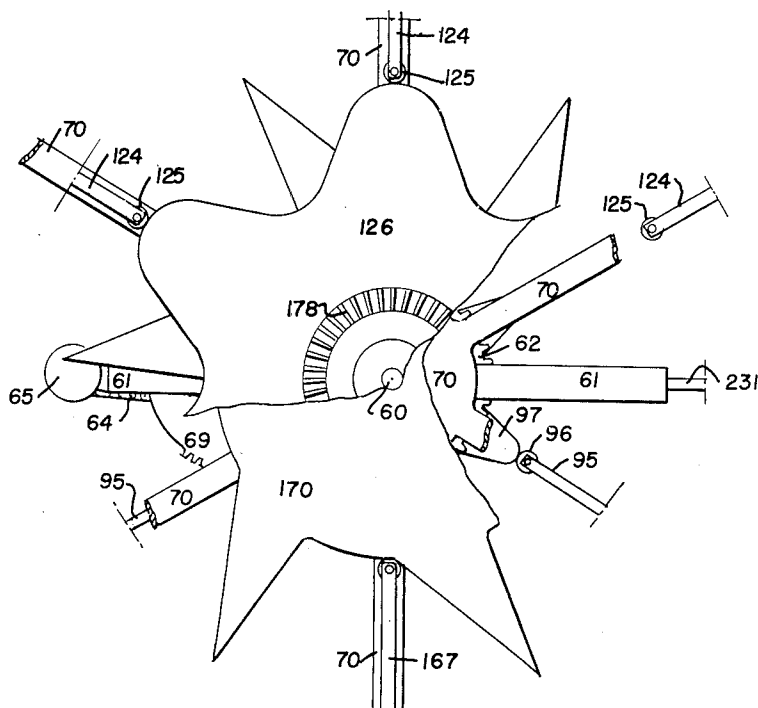


Fig. 2

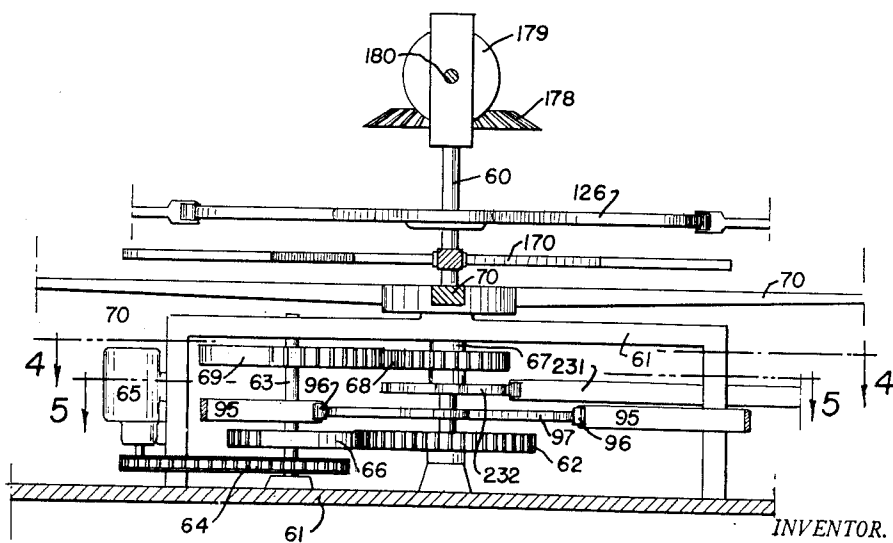


Fig. 3

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17 Sheets-Sheet 3

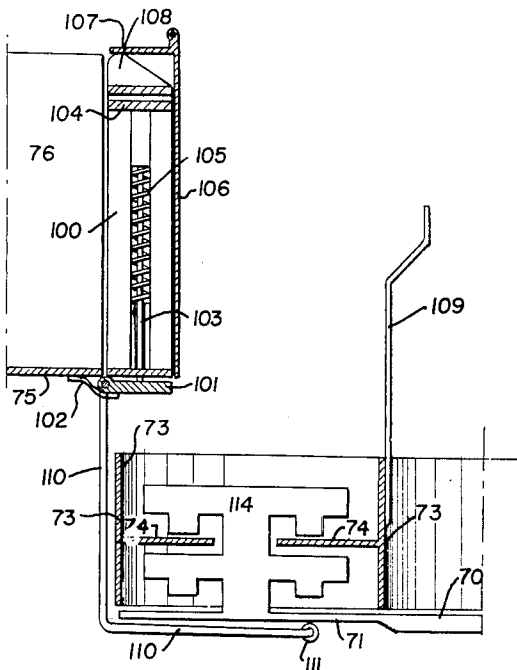


Fig. 33

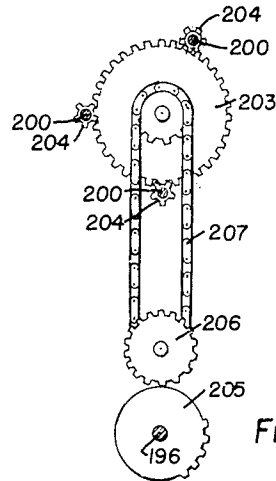


Fig. 41

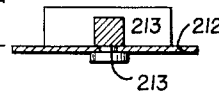


Fig. 42

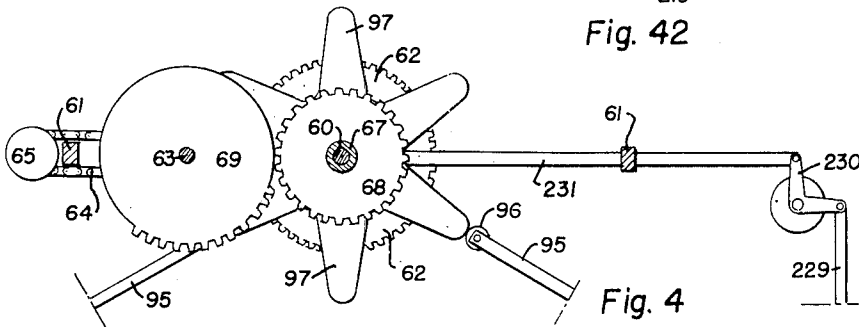


Fig. 4

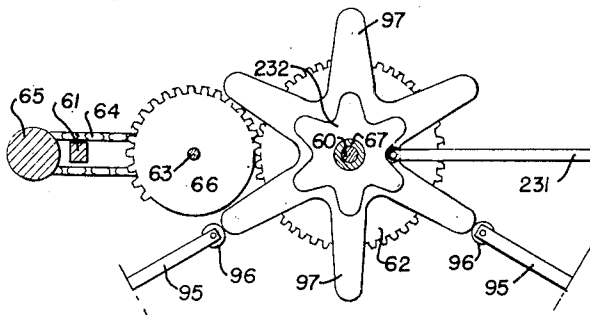


Fig. 5

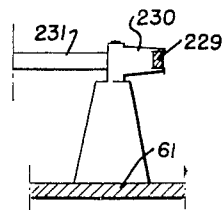


Fig. 56

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JAMES L. WHITSEL

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ATTORNEY

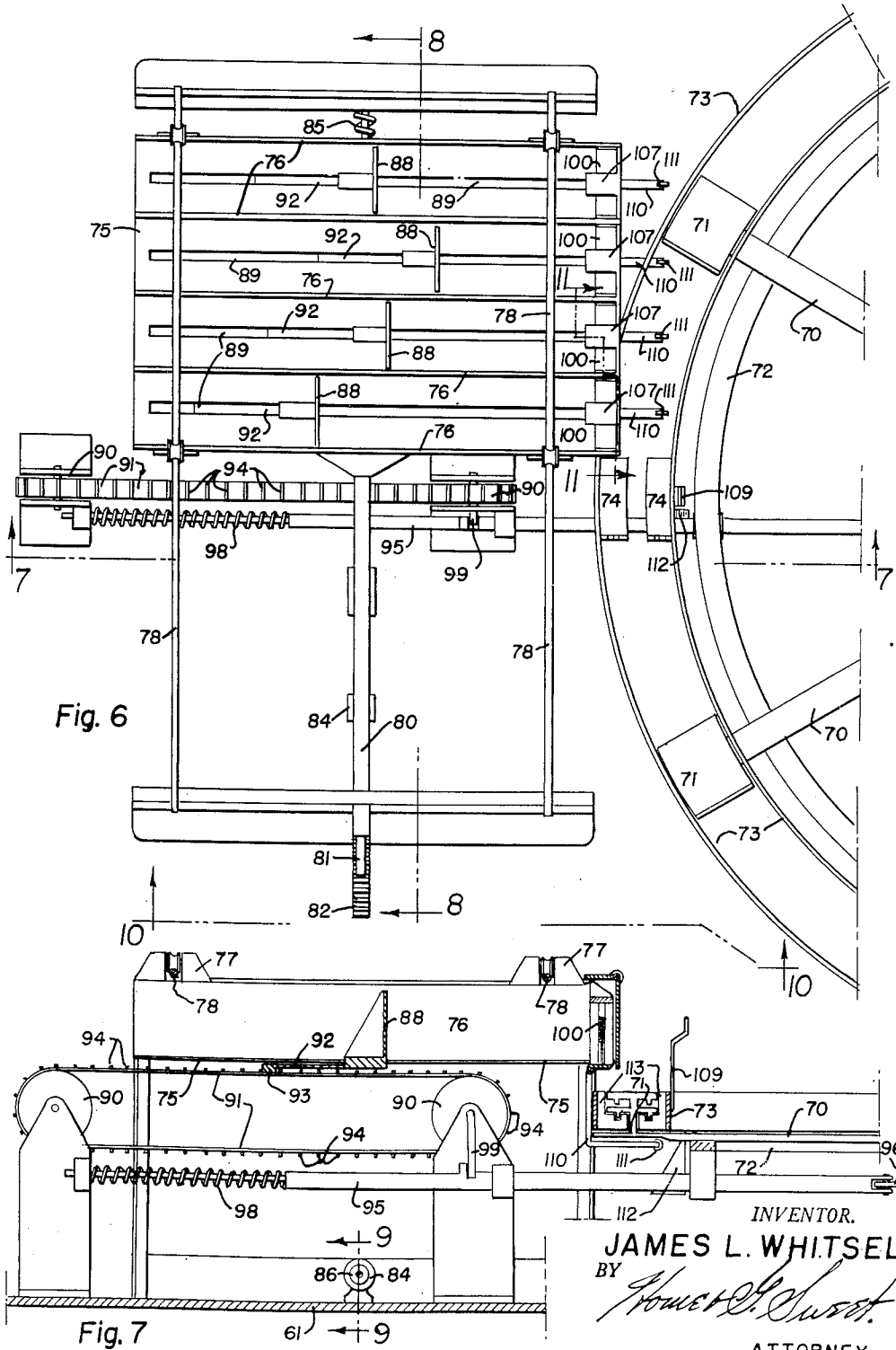
Jan. 27, 1953

J. L. WHITSEL
SANDWICH-MAKING MACHINE

2,626,575

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17 Sheets-Sheet 4



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SANDWICH-MAKING MACHINE

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17 Sheets-Sheet 5

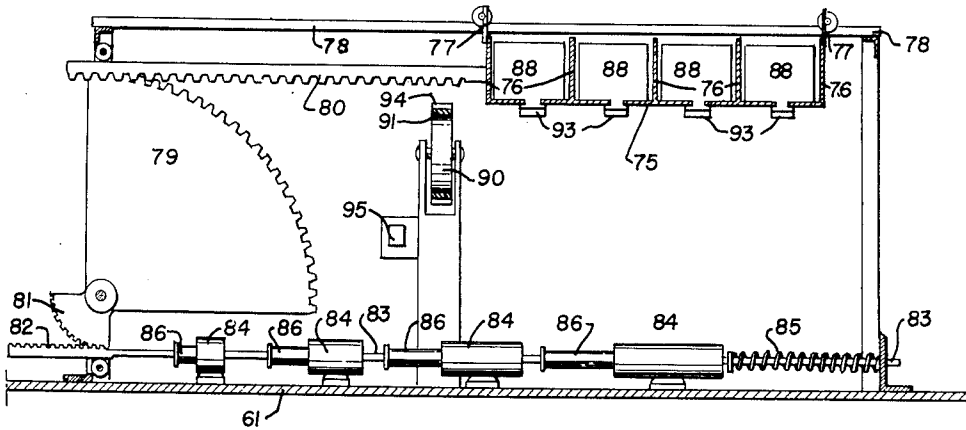


Fig. 8

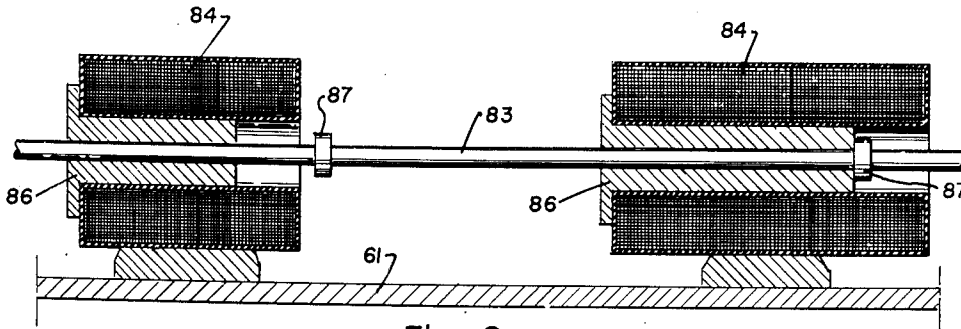


Fig. 9

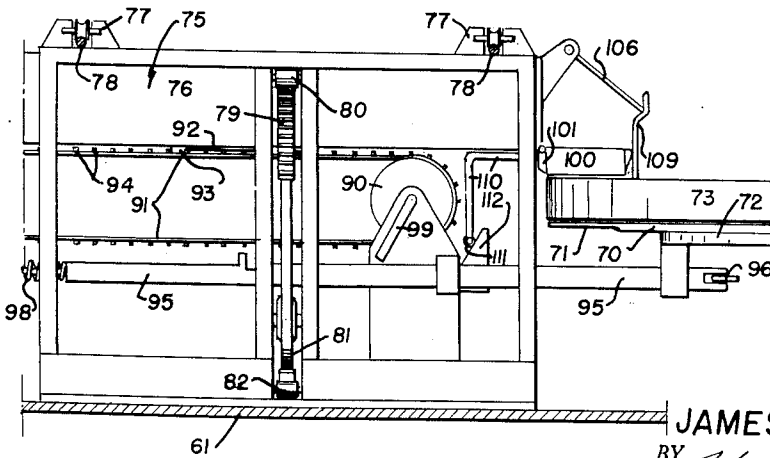


Fig. 10

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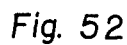


Fig. 11

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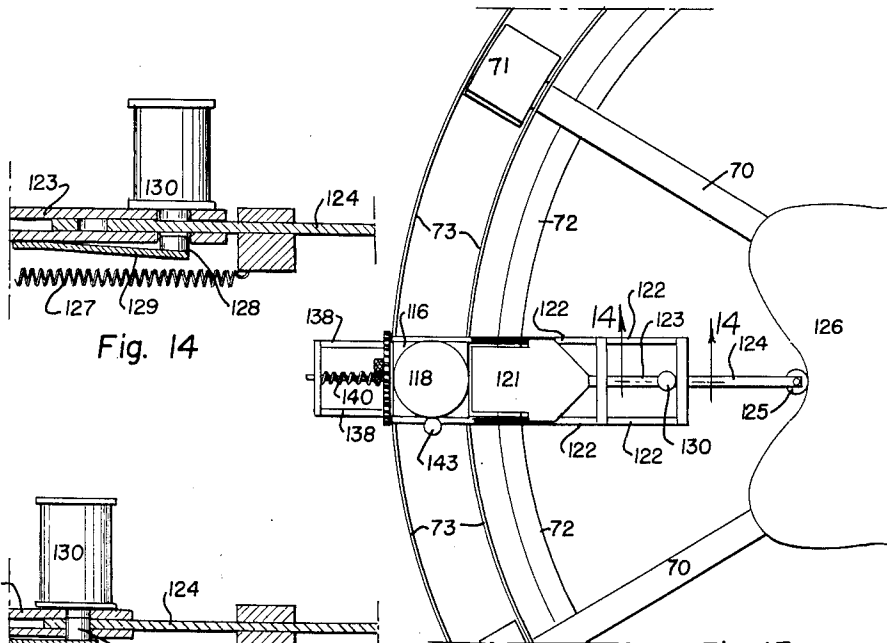


Fig. 14

Fig. 13

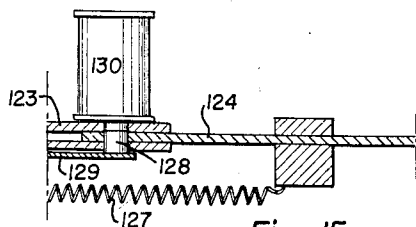


Fig. 15

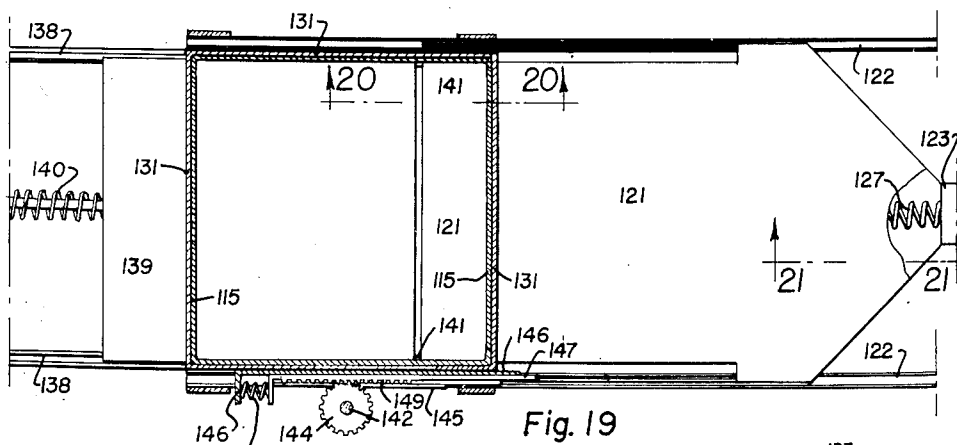


Fig. 19

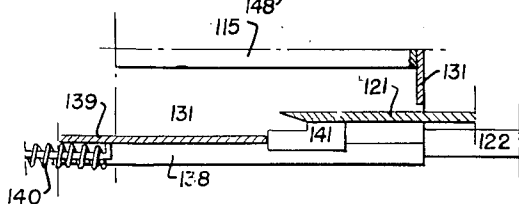


Fig. 20

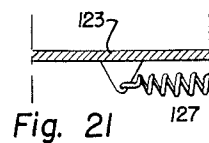


Fig. 21

INVENTOR.
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BY *Forrest L. Chrost*

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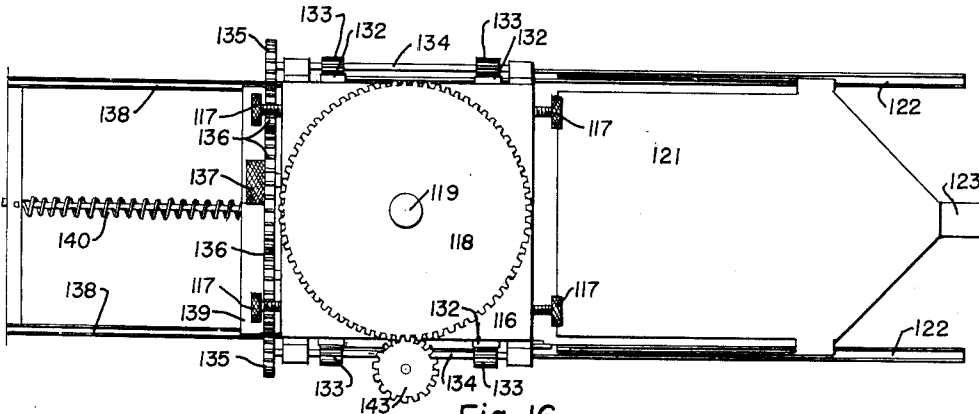


Fig. 16

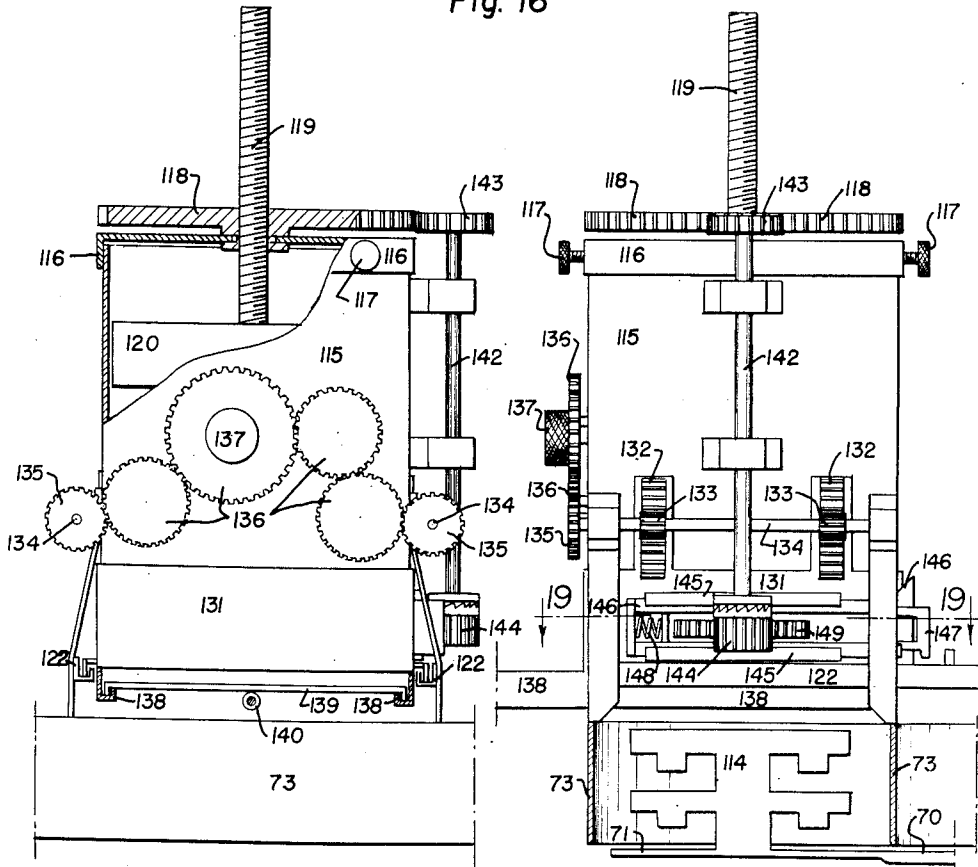


Fig. 17

Fig. 18

INVENTOR.

JAMES L. WHITSEL

BY

James L. Sweet

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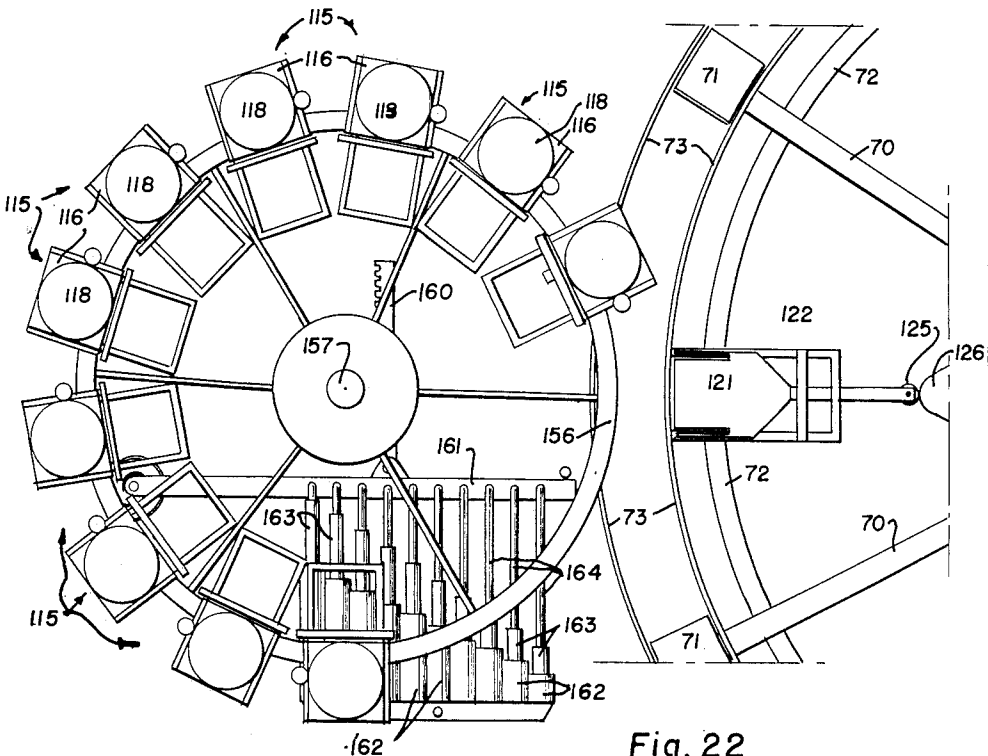


Fig. 22

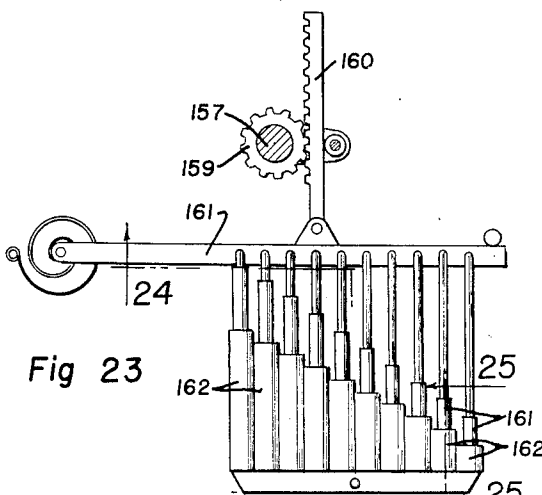


Fig. 23

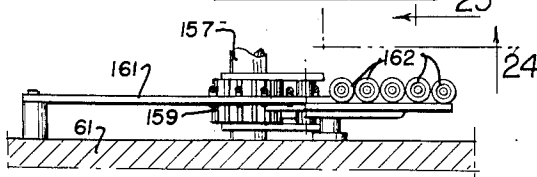


Fig. 24

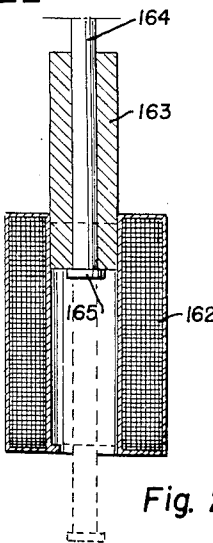


Fig. 25

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J. L. WHITSEL
SANDWICH-MAKING MACHINE

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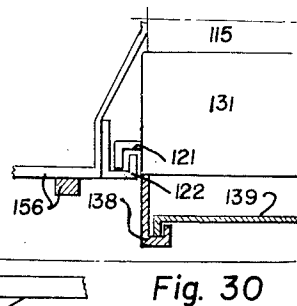
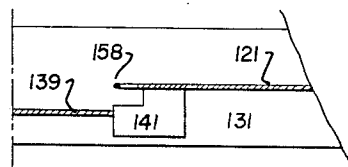
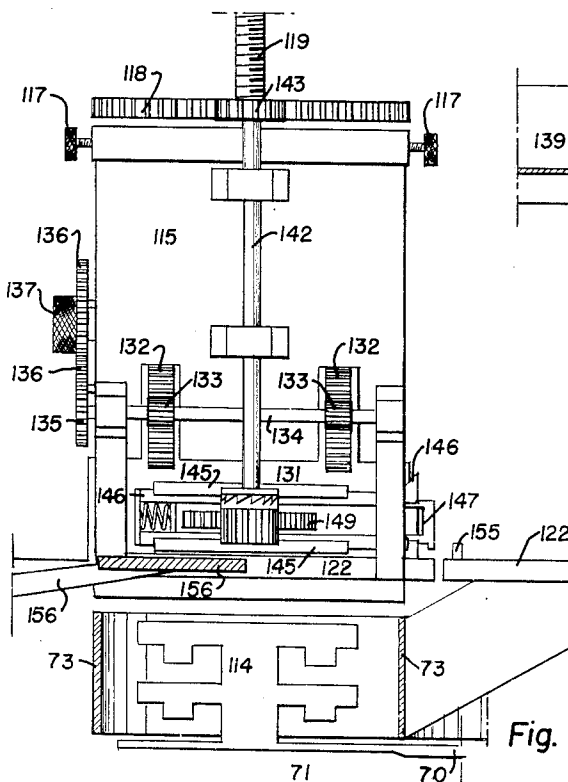
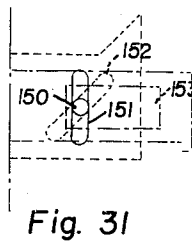
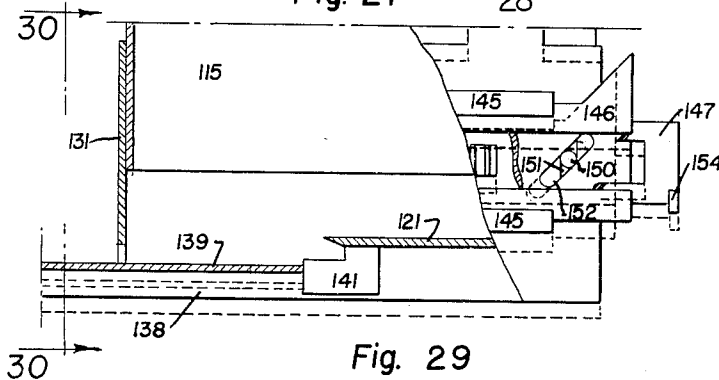
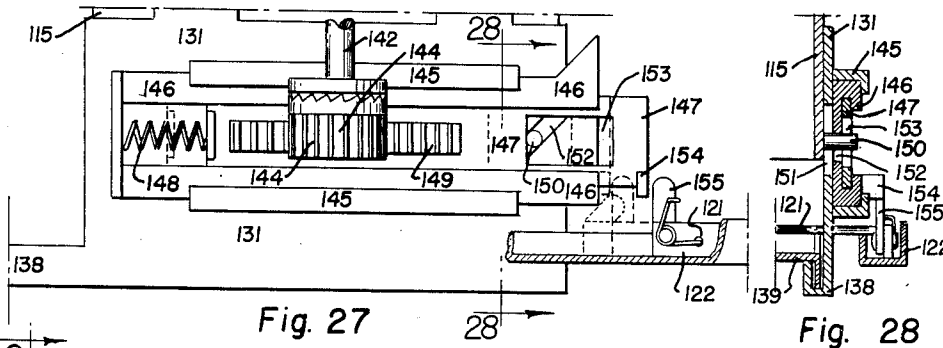


Fig. 26

INVENTOR.
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2,626,575

SANDWICH-MAKING MACHINE

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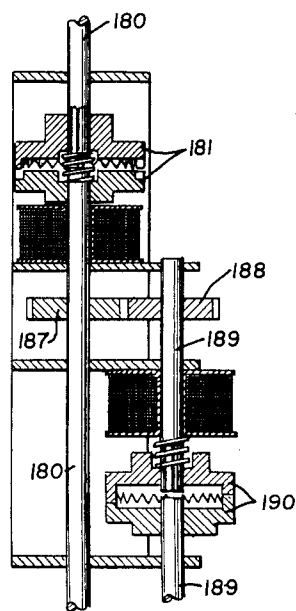
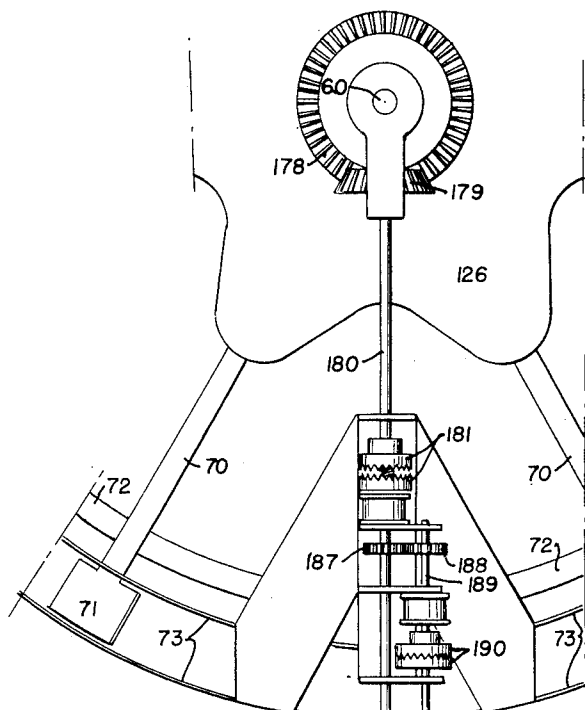


Fig. 37

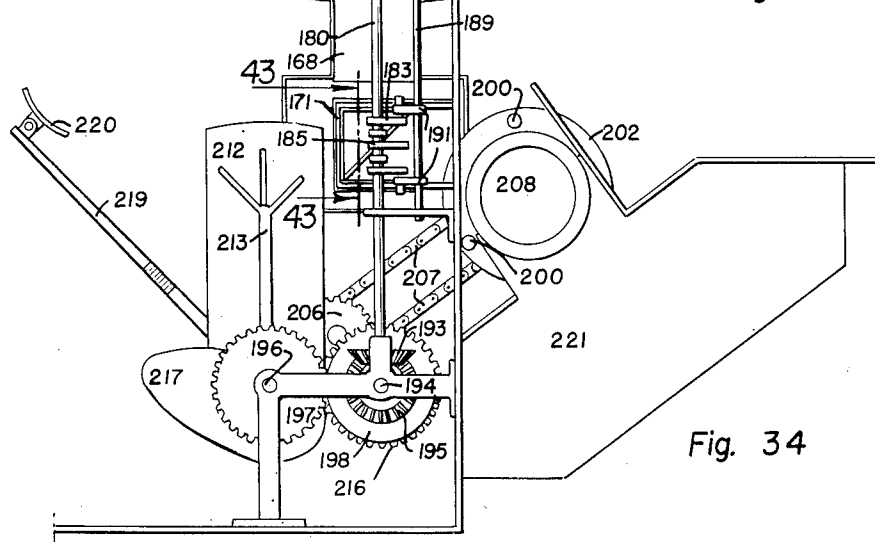


Fig. 34

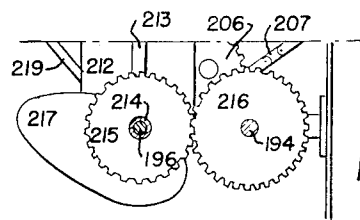


Fig. 36

INVENTOR.
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J. L. WHITSEL
SANDWICH-MAKING MACHINE

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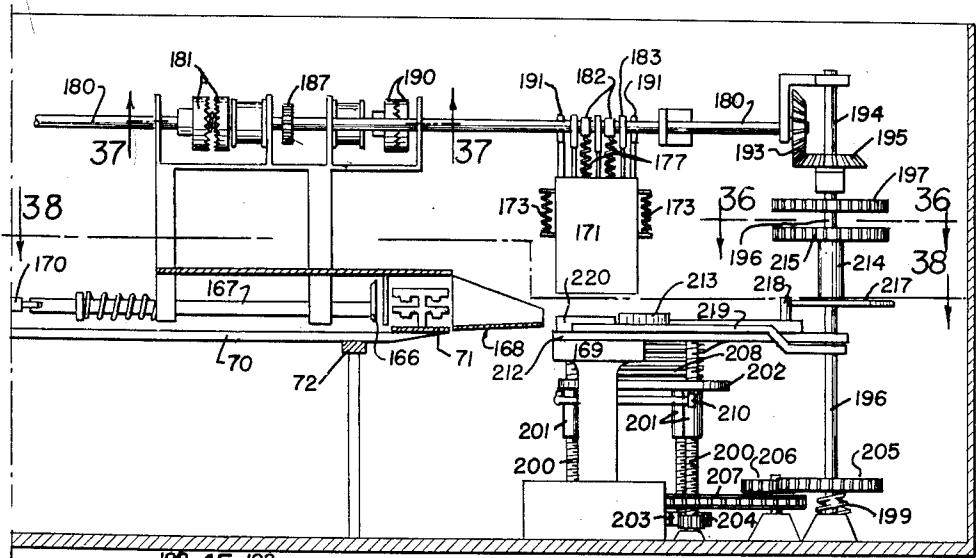


Fig. 35

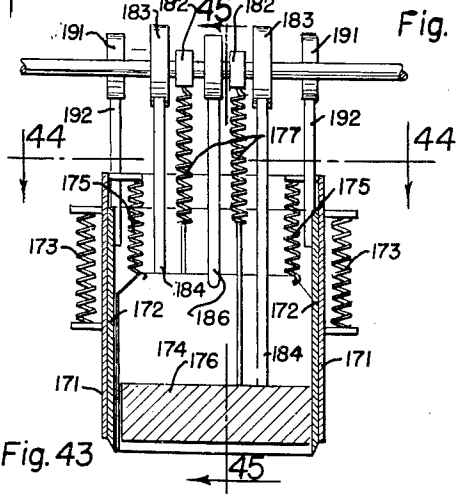


Fig. 43

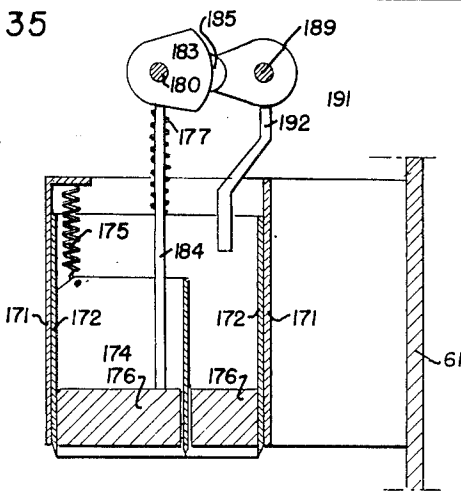


Fig. 45

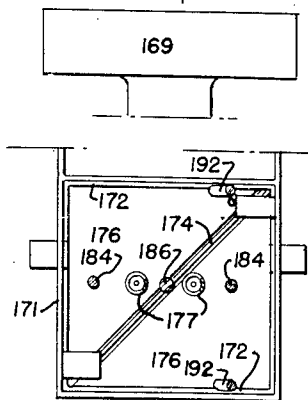


Fig. 44

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2,626,575

SANDWICH-MAKING MACHINE

Filed Nov. 19, 1948

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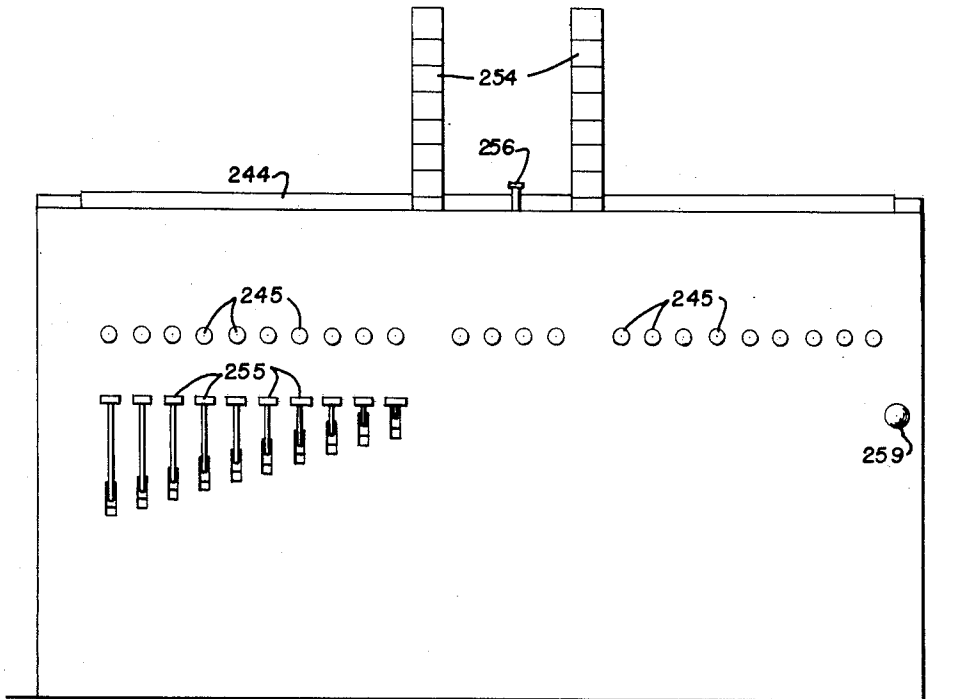


Fig. 46

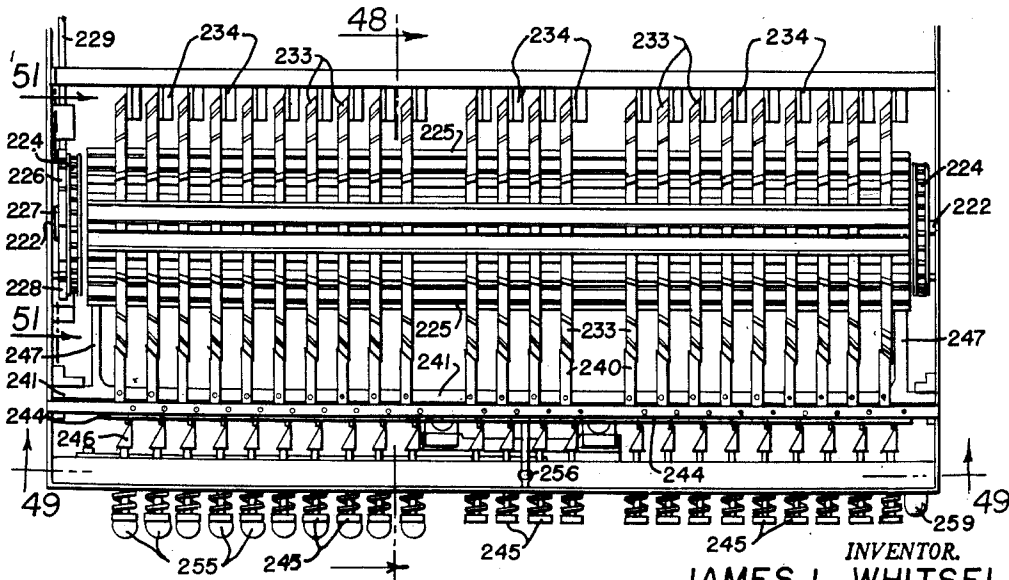


Fig. 47

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2,626,575

SANDWICH-MAKING MACHINE

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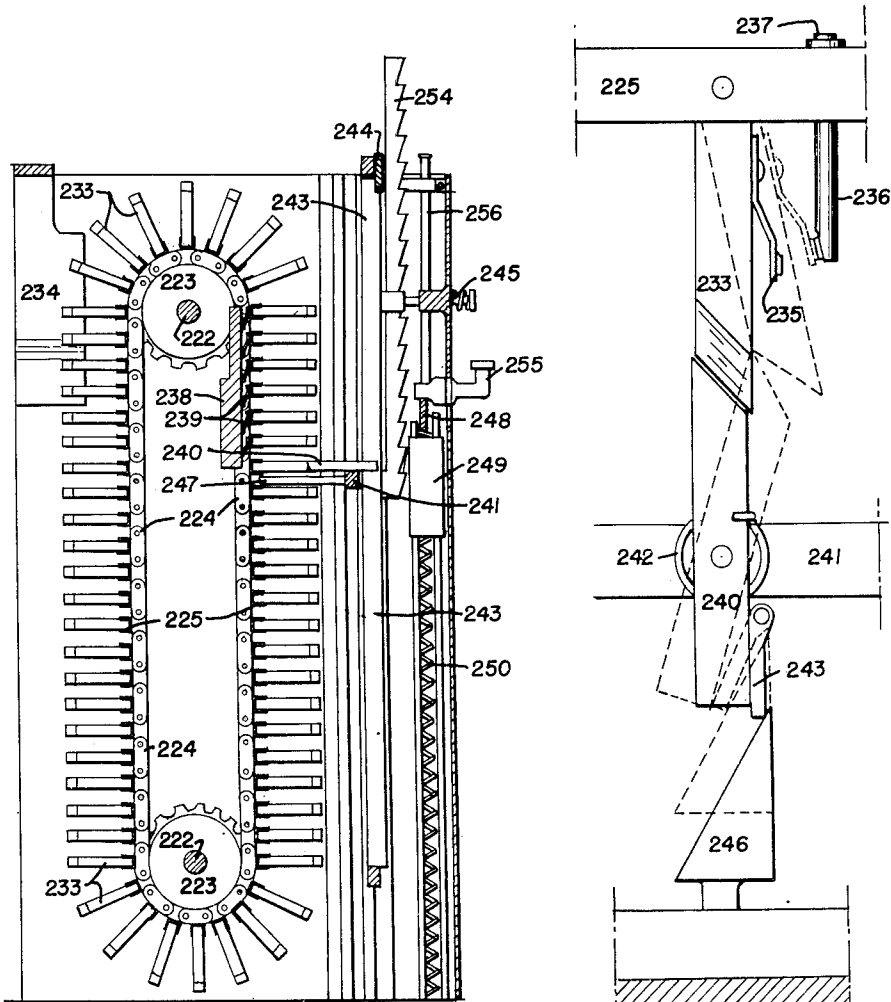


Fig. 48

Fig. 53

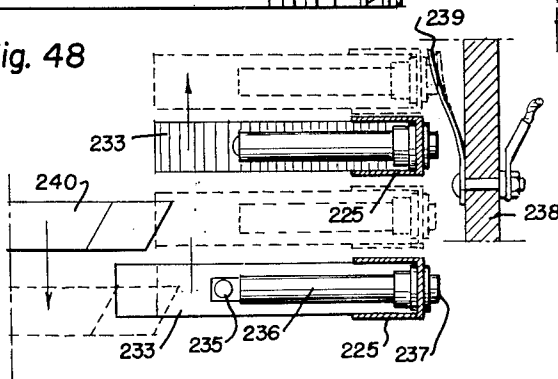


Fig. 54

INVENTOR.
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SANDWICH-MAKING MACHINE

2,626,575

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17 Sheets-Sheet 16

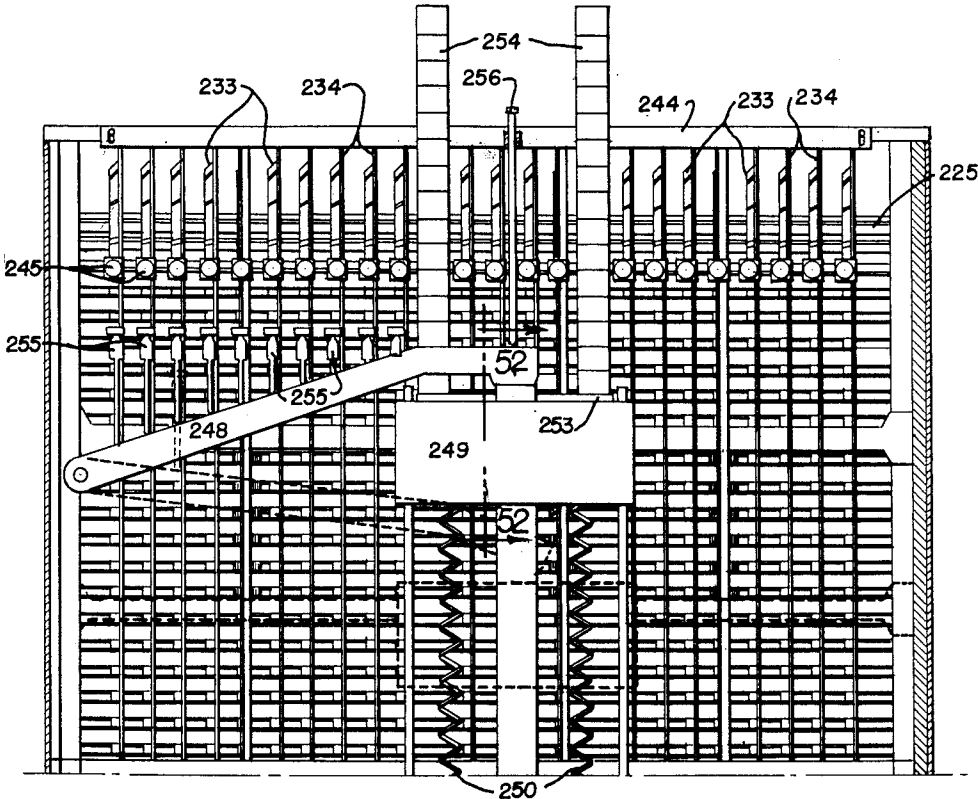


Fig. 49

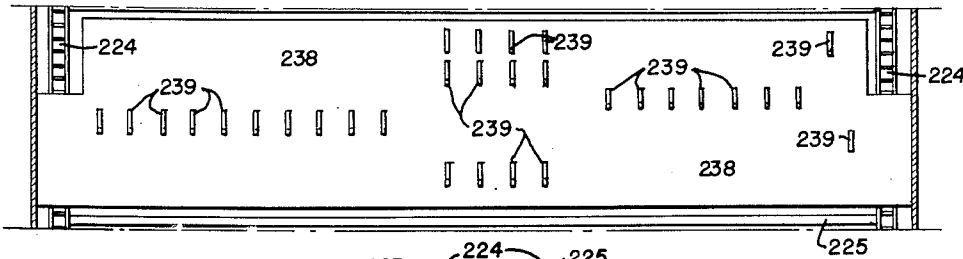


Fig. 50

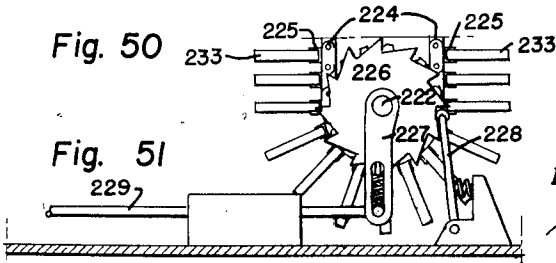


Fig. 51

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2,626,575

SANDWICH-MAKING MACHINE

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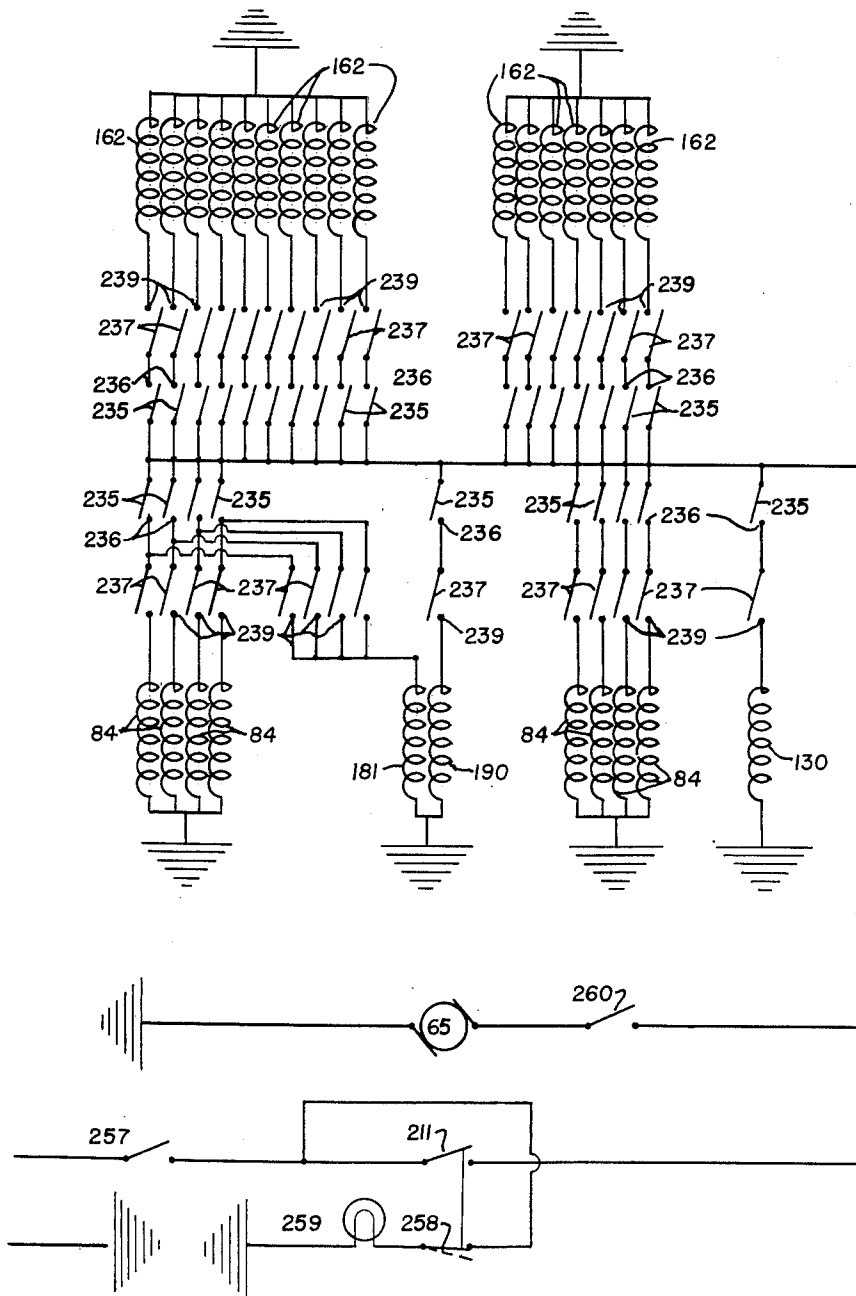


Fig. 55

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UNITED STATES PATENT OFFICE

2,626,575

SANDWICH-MAKING MACHINE

James L. Whitsel, Denver, Colo.

Application November 19, 1948, Serial No. 60,955

19 Claims. (Cl. 107—1)

1

This invention relates to sandwich-making machines and apparatus, and has as an object to provide an improved mechanical organization automatically operable to effect the assembly and delivery of assorted sandwiches in reaction to option indications selectively and manually charged thereinto.

A further object of the invention is to provide an improved sandwich-making machine characterized by extensive capacity for sandwich constituents selectively combinable thereby.

A further object of the invention is to provide an improved sandwich-making machine characterized by extensive capacity for option indications chargeable thereinto as determinants of the particular composition of sandwiches subsequently and successively produced thereby.

A further object of the invention is to provide an improved sandwich-making machine continuously and cyclically operable to simultaneously and progressively compose a plurality of particular sandwiches.

A further object of the invention is to provide improved means for the accommodation and selective delivery of assorted type bread slices in operative correlation with a sandwich-making machine.

A further object of the invention is to provide improved means for the accommodation and selective delivery of lettuce in operative correlation with a sandwich-making machine.

A further object of the invention is to provide improved means for the accommodation and selective delivery of assorted filling materials in operative correlation with a sandwich-making machine.

A further object of the invention is to provide improved means in operative correlation with a sandwich-making machine for selectively supplying either a single or double charge of assorted filling materials to a given sandwich.

A further object of the invention is to provide improved means in operative correlation with a sandwich-making machine automatically effective to divide and plate-deliver completed sandwiches produced by said machine.

A further object of the invention is to provide improved means in operative correlation with a sandwich-making machine selectively effective to trim the sandwiches produced by said machine as an incident of sandwich transfer to ultimate plate-delivery.

A further object of the invention is to provide improved means for the accommodation and automatic supply of serving plates in operative cor-

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relation with the delivery of completed units from a sandwich-making machine.

A further object of the invention is to provide improved, manually-actuatable, option-registering means in operative correlation with and for the selective control of automatic functions of a sandwich-making machine.

A further object of the invention is to provide an improved sandwich-making machine that is operatively fully automatic in reaction to selective, manually-imposed, option indications, rapid in the completion and successive delivery of sandwich units, free from onerous servicing and maintenance requirements, compact and of small size in relation to its output capacity, susceptible of construction in size and capacity variations suited to all practical requirements, adaptable to coin control as an automatic vending device, positive and efficient in attainment of the ends for which designed, and durable throughout a long life of actual use.

With the foregoing and other objects in view, my invention consists in the construction, arrangement, and combination of elements herein-after set forth, pointed out in my claims, and illustrated by the accompanying drawings, in which—

Figure 1 is a schematic plan view of the elements and sub-assemblies constituting the improved apparatus as correlated and interrelated in a typical operative embodiment of the invention. Figure 2 is a top plan view, on an enlarged scale and with overlying elements progressively and partially broken away to show otherwise concealed construction, of the central drive cluster shown in Figure 1. Figure 3 is a side elevation, partly in section, of the showing of Figure 2. Figure 4 is a detail section taken on the indicated line 4—4 of Figure 3. Figure 5 is a detail section taken on the indicated line 5—5 of Figure 3. Figure 6 is a detail plan, on an enlarged scale, of the elements constituting the first, or bread-slice-delivering, station of the apparatus in non-operating interrelation. Figure 7 is a cross section taken on the indicated line 7—7 of Figure 6 with the bread-carrier shifted to operating relation with its station. Figure 8 is a cross section taken on the indicated line 8—8 of Figure 6. Figure 9 is a fragmentary detail section, on an enlarged scale, taken substantially on the indicated line 9—9 of Figure 7. Figure 10 is an end view of the bread-carrier as positioned for delivery to the apparatus first station, as it would appear from substantially the position indicated by the line 10—10 of Figure 6. Figure 11 is a fragmentary,

detail section, on an enlarged scale, taken through the bread-carrier as positioned for delivery on substantially the indicated line 11—11 of Figure 6. Figure 12 is a fragmentary, detail section taken substantially on the indicated line 12—12 of Figure 11, broken lines in the view denoting alternative positions of relatively movable elements. Figure 13 is a detail plan, on an enlarged scale, of the elements constituting the second, or lettuce-slice-delivering station of the apparatus. Figure 14 is a fragmentary, detail section, on an enlarged scale, taken substantially on the indicated line 14—14 of Figure 13. Figure 15 is a view similar to Figure 14 illustrating movable elements of the latter view in alternative interrelation. Figure 16 is a top plan view, on an enlarged scale, of the lettuce receiver and associated mechanism represented in Figure 13. Figure 17 is an outer, or left-hand wall, elevation of the apparatus shown in Figure 16, on a somewhat enlarged scale. Figure 18 is an elevation at right angles to the showing of Figure 17. Figure 19 is a fragmentary, detail section taken substantially on the indicated line 19—19 of Figure 18. Figure 20 is a fragmentary, detail section taken substantially on the indicated line 20—20 of Figure 19. Figure 21 is a fragmentary, detail section, taken substantially on the indicated line 21—21 of Figure 19. Figure 22 is a detail plan, on an enlarged scale, of the elements constituting the third, or filling-material-delivering, station of the apparatus in non-operative interrelation. Figure 23 is a fragmentary, detail plan, partially in section, of receiver actuating and positioning means associated with the apparatus shown in the preceding view. Figure 24 is an end elevation of the showing of Figure 23. Figure 25 is a fragmentary, detail section, on an enlarged scale, taken substantially on the indicated line 25—25 of Figure 23. Figure 26 is a side elevation, on an enlarged scale, of one of the receivers represented in Figure 22 as registered with and for delivery to the apparatus third station. Figure 27 is an elevation, on a further enlarged scale, partially in section and with elements broken away, of the lower end of the receiver shown in Figure 26. Figure 28 is a fragmentary, detail section taken on substantially the indicated line 28—28 of Figure 27. Figure 29 is a multi-vertical-section view taken on various parallel planes through the showing of Figure 27. Figure 30 is a fragmentary, detail elevation, partly in section, of a corner of the receiver as viewed from substantially the position indicated by the line 30—30 of Figure 29. Figure 31 is a detail, phantom view of elements and interrelationships inherent in the showing of Figure 29. Figure 32 is a fragmentary, detail section illustrating a construction alternative to that of the analogous elements shown in Figure 29. Figure 33 is a fragmentary, detail section through the fifth, or second bread-slice-delivering, station of the apparatus with the associated bread-carrier registered for delivery thereto. Figure 34 is a detail plan, on an enlarged scale, of the elements constituting the sixth, or sandwich transferring, dividing, trimming, and delivering, station of the apparatus. Figure 35 is a side elevation of the major portion of the showing of Figure 34. Figure 36 is a fragmentary, detail section, taken substantially on the indicated line 36—36 of Figure 35. Figure 37 is a fragmentary, detail section, on an enlarged scale, taken substantially on the indicated line 37—37 of Figure 35. Figure 38 is a section taken sub-

stantially on the indicated line 38—38 of Figure 35. Figure 39 is an end elevation of the arrangement according to Figure 38, certain elements of the latter view being in section. Figure 40 is a fragmentary, detail section, on an enlarged scale, through automatic carrier latching and releasing means indicated in the preceding view. Figure 41 is a fragmentary, detail section taken substantially on the indicated line 41—41 of Figure 39. Figure 42 is a fragmentary, detail section, on an enlarged scale, taken substantially on the indicated line 42—42 of Figure 38. Figure 43 is a fragmentary, detail section, on an enlarged scale, taken substantially on the indicated line 43—43 of Figure 34. Figure 44 is a fragmentary, detail section, taken substantially on the indicated line 44—44 of Figure 43. Figure 45 is a fragmentary, detail section, taken substantially on the indicated line 45—45 of Figure 43. Figure 46 is a front, or face, elevation of a typical control unit for the apparatus. Figure 47 is a top plan view of the arrangement typified by Figure 46. Figure 48 is a cross section taken substantially on the indicated line 48—48 of Figure 47. Figure 49 is a vertical section taken substantially on the indicated line 49—49 of Figure 47, certain actuators being shown in full-view plane paralleling that of the section. Figure 50 is a detail elevation of a contact panel shown in section in Figure 48. Figure 51 is a fragmentary, detail section taken substantially on the indicated line 51—51 of Figure 47. Figure 52 is a fragmentary, detail section, on an enlarged scale, taken substantially on the indicated line 52—52 of Figure 49. Figure 53 is a fragmentary, detail, plan view of means employed for the selective charging of options into the control unit, broken lines indicating alternative operative positions of movable elements represented therein. Figure 54 is a somewhat schematic end view of certain of the elements shown in Figure 53, arrows indicating direction of movable element travel and broken lines representing alternative element positions incident to their travel. Figure 55 is a conventionalized diagram of the circuits and electrical facilities employed to effect the controls and automatic operative reactions inherent in the apparatus. Figure 56 is an elevation of and at right angles to the right-hand portion of the showing of Figure 4.

In the illustrated embodiment of the invention, a shaft 60 is mounted for rotation in and to upstand vertically from and above suitable fixed frame elements 61 and is furnished with a concentric, fixedly-associated gear 62 adjacent its lower end. A second shaft 63 is journaled for rotation in the frame elements 61 in spaced, parallel relation with the shaft 60 and is suitably connected, as by means of a chain 64, in driven relation with an electric motor 65 in such manner as to reflect actuation of said motor as rotation of the shaft 63 at desired speed, and a mutilated gear 66 is fixed to said shaft 63 for intermittent drive coaction with the gear 62. A sleeve hub 67 is journaled for independent rotation in the frame elements 61 about a portion of the shaft 60 above the gear 62 and fixedly carries a gear 68 spacedly paralleling said gear 62, and a mutilated gear 69 is fixed to the shaft 63 in spaced parallelism with the gear 66 for intermittent drive coaction with said gear 68. While the gear ratios and drive intervals of the arrangement shown and described are susceptible of wide variation to fit the requirements of a particular operative assembly, it is expedient to assume that

in this instance they are such as to effect a sixty degree rotation of the shaft 60 during a ten second interval and a sixty degree rotation of the hub 67 during a subsequent five second interval while the motor 65 is continuously operating; the shaft 63 hence making one complete revolution in fifteen seconds, the shaft 60 being at rest when the hub 67 is rotating, and said hub 67 being at rest when the shaft 60 is rotating.

A plurality, in this instance six, of identical arms 70 fixedly radiate from and in a uniform angular spacing about the upper end of the hub 67 and a rectangular, flat plate 71, of a size suitable for supporting accommodation of a sandwich, is similarly fixed to the outer end upper edge of each arm 70 for rotation with the latter through a common annular orbit concentric with and perpendicular to the shaft 60 axis; an annular track 72 fixedly supported by the elements 61 inwardly adjacent and in a parallel plane offset below that of the plate 71 rotational orbit engaging with slide blocks or rollers on the lower edges of the arms 70 to altitudinally guide, position, and support outer ends of said arms and the plates 71 fixed thereto. Spacedly parallel, cylindrical walls 73 coaxial with the shaft 60 are fixedly supported relative to the elements 61 to correspondingly rise above and define the orbital paths of the plate 71 inner and outer margins, and said walls are worked or intersected at uniform angular distances of sixty degrees to define orbitally successive stations corresponding with the plate 71 locations when the hub 67 and related elements are at rest.

It is the function of the plates 71 to each successively receive the elements constituting a particular sandwich as it progresses from station to station of the walls 73 and to ultimately deliver the completed sandwich at the final such station, each said plate 71 being hence a carrier on which a complete sandwich is assembled, and the initial station of the operative cycle is consequently one arranged to deposit a slice of selected type of bread on the plate 71 registered therein; such initial station being represented as that where the walls 73 are modified to provide spacedly-opposed, perpendicularly-related webs 74 on their lower margins partially obstructing the annular channel between said walls and closely overlying the position of a plate 71 as disposed when the hub 67 is at rest, said webs 74 having an extent circumferentially of the walls 73 approximating the width of a plate 71.

The bread to be supplied at the initial station of the apparatus is provided in the form of sliced loaves, or units of assembled slices, charged within a multi-compartment receiver wherein each compartment is adapted to store a given type or kind of bread in a manner to permit selective delivery to the station-registered plate 71 as hereinafter set forth. The initial station bread receiver of the illustrated embodiment is shown as a unit 75 in the form of a flat, open-top, open-end pan of suitable depth longitudinally divided by upstanding partitions 76 to provide four like, parallel troughs each of a size to accommodate standard bread slices transversely thereof; the provision of four such troughs making possible the storage and selective delivery of four kinds or types of bread, such as white, whole wheat, rye, and toast, for example. The unit 75 is furnished with wheel-equipped hangers 77 upstanding from and adjacent the ends of its closed long sides, and the wheels of said hangers engage with and ride on fixedly-elevated, horizontal tracks 78 dis-

posed above and outwardly tangential to the plate 71 orbit to rollably support said unit for selective registration of its trough ends with and above the webs 74 marking the initial station of the apparatus; the track 78 disposition being such as to align each trough registered with the webs 74 radially of the channel defined by the walls 73. Selective registration of the unit 75 troughs with the webs 74 of the initial station in response to the actuation of selectors and controls, hereinafter to be described, is automatically accomplished through the agency of electrically-responsive means and connections susceptible of diverse construction and operative arrangement as typified by the showing of the drawings. A toothed quadrant 79, of relatively-large radius, is journaled at its apex for actuation through a vertical arc transverse of the unit 75 troughs, in this instance on the side of the unit 75 leading in the direction of desired shift, and meshes with a rack bar 80 fixed to and extending perpendicularly from the adjacent unit 75 side, while a toothed quadrant 81, of relatively lesser radius, fixed to or integral with the quadrant 79 extends in opposition to the latter and oppositely from the journal axis to meshed engagement with a rack bar 82 underlying and spacedly paralleling the bar 80. One end of the rack bar 82 is extended as an aligned, elongate stem 83, conveniently cylindrical, through the hollow cores of a succession of spacedly-aligned, electro-magnetic coils corresponding in number with the number of troughs in the unit 75, and the end of the stem 83 beyond the last of the coils 84 is resiliently loaded, as by means of a spring 85 expansively engaging between a collar on said stem and fixed elements of the track 78 support, to yieldably maintain the rack bar 82 at the limit of its travel away from the coils 84 and the unit 75 through the agency of the quadrants 79 and 81 and the rack bar 80, at the limit of its travel away from trough registration with the webs 74. The coils 84 are designed to function as solenoids in co-action with shiftable armatures 86 loosely strung on the stem 83, to which end the successive coils and associated armatures are graduated in length, from a minimum adjacent the quadrant 81 to a maximum adjacent the spring 85, so as to provide, when independently energized, an associated armature travel effective as a corresponding shift of the stem 83 to act through the quadrant and rack bar linkage to register the unit 75 trough corresponding in number of succession with the energized coil above and in position to deliver to the webs 74. Thus, the coil 84 adjacent the quadrant 81 will have an armature travel, or throw, sufficient to register the last trough of the unit with the delivery station, while the intermediate coils will be proportioned to respectively register the second and third troughs with the delivery station. To position the armatures 86 along the stem 83 for effective use and to apply reaction of said armatures to shift of said stem, collars 87 are fixed to and at intervals along the stem 83, one such collar being provided for each coil 84, and the disposition of such collars is such as to engage each of them with the coil-entering end of the associated armature in maximum operative projection of the armatures from their respective coils when all of the coils are de-energized and the stem 83 is at the limit of its travel range under the expansive influence of the spring 85. The coils 84 may be wired for either independent or progressive energization, it being apparent that each of the longer coils includes in

its armature travel range the armature throw or travel of the preceding shorter coil or coils, and the arrangement of stem 83 and collars 87 permits effective independent operation of the coils 84 and their armatures 86, since energization of any given coil operates through the associated armature and related collar 87 to shift the stem 83 against the pressure of the spring 85, the remaining collars 87 shifting with said stem away from and into clearing relation with their respective armatures.

Each of the unit 75 troughs is equipped with a transversely-upstanding, longitudinally-shiftable follower 88 slidably associated with margins of an elongate slot 89 centrally and longitudinally intersecting the floor of the trough between, but not through, the trough floor ends, each said follower 88 being adapted to close over and bear against the outer end of the sliced loaf or assembled slices charged within the associated trough and to shift the trough charge inwardly toward the delivery station in reaction to automatic feed means operatively engageable therewith when the associated trough is registered with said station. When the unit 75 is out of trough registration with the delivery station, the followers 88 of the unit troughs are free for manual shift longitudinally of their respective troughs within the limits imposed by the lengths of the slots 89, thus facilitating charging of the troughs and manual closing of each follower against the outer end of each trough charge. Aligned radially of the plate 71 orbit with the delivery station defined by the webs 74 and spacedly exterior to the walls 73, suitable supports fixedly upstanding from the frame elements 61 rotatably mount like drums or rollers 90 for revolution in a common vertical plane about spaced horizontal axes, so that an endless belt or web 91 engaged between and about the rollers 90 is disposed with its upper run beneath and spacedly paralleling the reciprocatory plane of the unit 75 floor or bottom in projection radially of and outwardly beyond the plate 71 orbit at the initial delivery station of the apparatus. Each follower 88 is provided with a fixed arm 92 extending therefrom longitudinally and outwardly of the associated trough immediately beneath the said trough floor and hence in position to ride freely over the belt 91 upper run when the unit 75 is shifted to pass over the latter, said arm 92 being provided with a downwardly-offset terminal block 93, and the belt 91 is equipped with a succession of transverse lugs 94 projecting from its outer surface throughout its length in a uniform spacing corresponding with the slice thickness of the charge carried by the unit 75 troughs. The dimension of the block 93 longitudinally of the associated trough is such as to engage between adjacent lugs 94 of the belt 91 when an associated trough of the unit 75 is registered with the delivery station, thereby latching the corresponding follower 88 to said belt for shift longitudinally of its trough consequent upon travel of said belt on and about its rollers 90. A feed bar 95 is mounted to reciprocate through suitable fixed guides radially of and beneath the plate 71 orbit adjacent and in parallelism with the belt 91 under run and in inner end engagement through the agency of a rotatable follower 96 with the eccentric margin of a six-lobed cam 97 fixed to the shaft 60 adjacent the gear 62, an expansive coil spring 98 yieldably urging said bar inwardly of the plate 71 orbit to maintain its follower 96 against the cam 97 margin, and a radial arm 99 ratchet-connected

with the roller 90 more nearly adjacent the plate orbit depends from the axis of said roller to intersect the path of feed bar 95 travel. The ratchet connection between the arm 99 and associated roller is such as to engage with and rotate said roller for travel of the belt 91 upper run inwardly toward the plate 71 orbit when the depending, free end of said arm is swung outwardly away from said orbit and to permit return of said arm free end toward said orbit without rotative effect on the associated roller, and the free end of said arm 99 is engaged in a notch opening upwardly from the feed bar 95 upper margin, said notch being defined between a shorter bar shoulder more nearly adjacent the plate 71 orbit and a longer, more elevated shoulder remote from said orbit, in such manner as to latch the arm end to and for travel with said bar when the latter is at the inner limit of its range of reciprocation and to free said arm end to slide along and cease travel with said bar when the said arm has been moved a distance sufficient to advance the ratchet-engaged roller 90 a distance effective to shift the belt 91 for one unit advance of its lugs 94; the outer, more elevated bar 95 notch shoulder serving to return the arm 99 free end to its notch seat during inward travel of the bar. Such ratchet advance of the roller 90 and belt 91 acts through a follower 88 engaged with the belt to shift the charge of the associated trough toward the trough inner end a distance corresponding with the thickness of a charge slice.

The otherwise open inner end of each unit 75 trough is furnished with and normally closed by a slice placer reactive to reciprocation of the feed bar 95 when the associated trough is registered with the delivery station to deposit a slice of its trough charge on the webs 74 characterizing said station, the said slice placers of the separate troughs being identical. Each slice placer comprises a rigid, open, rectangular frame 100, of a thickness approximating that of the slices to be placed thereby, an open area adequate for the accommodation of a trough charge slice, and an exterior outline conformable with the trough inner end, and said frame 100 is hinged for actuation about an axis paralleling the inner floor end of the associated trough through a vertical arc of ninety degrees between side and lower end element registration with the floor and side walls of the trough and projection in a plane paralleling and inwardly of the apparatus from the trough floor wherein the frame overhangs the webs 74 when the associated trough is registered with the delivery station. The hinge mounting the frame 100 also supports, for independent articulation thereon, a trigger plate 101 substantially coextensive with and closely underlying the lower end element of the said frame, a spring 102 about said hinge operating to normally and yieldably hold the plate 101 in elevated position against the adjacent end of the frame and the latter consequently in registration with the trough inner end, and links 103 hingedly engaged with opposite ends of the plate 101 uprise through channels in the side elements of the frame 100 to connect with arms of a yoke 104 slidably accommodated within the upper span of the frame 100 with its transverse member paralleling and underlying the upper end element of said frame, expansive coil springs 105 about the links 103 in end-bearing engagement between ends of the yoke arms and shoulders of the frame 100 serving to yieldably maintain said yoke at the upper limit of its adjustment within and relative to

said frame. Ears outstanding from upper corners of the trough inner end provide hinge support for the angle axis of an L-shaped frame closure whereof the greater web 106 is disposed to cover and obstruct the extreme inner end of the frame opening when said frame is registered with its trough end and a lesser, narrower web 107 is disposed to spacedly parallel and overhang the frame upper end element in fixed, perpendicular relation with the web 106 in the stated relation of frame and trough, and an arcuate ear 108 upstanding fixedly from the frame 100 top end element within the angle between the webs 106 and 107 is contoured to engage the former web and swing the closure about its hinge mounting into clearing relation with the said frame as the latter is swung outwardly and downwardly away from registration with its trough end, and to engage the web 107 and thereby return the web 106 into closing relation over the frame opening as said frame is swung upwardly and inwardly into registration with its trough end; a leaf spring 109 fixedly upstanding from the inner of the walls 73 above the adjacent web 74 being formed to frictionally engage the lower margin of the web 106 as the latter is caused to swing away from the frame 100 and to hold said web in clearing relation with the path of said frame until released and returned through co-action of the ear 108 and web 107.

Automatic actuation of the slice placer is accomplished through the agency of an L-shaped arm 110 fixed at one end adjacent the hinge margin of and to depend perpendicularly from the trigger plate 101 exteriorly past the outer wall 73 with its free, perpendicularly-related end portion spacedly underlying the plate 71 orbit and directed radially and inwardly of the apparatus when the associated trough is registered with the delivery station. Thus, each slice placer being equipped with an arm 110, registration of any unit 75 trough with the delivery station disposes its arm 110 free end portion, which is supplied with a terminal wheel or roller 111, in substantial parallelism with and above a side margin of the feed bar 95 and in the travel path of an incline block 112 fixed to and for reciprocation with said bar, said incline block having a margin engageable with the roller 111 inclined outwardly and downwardly of the apparatus and being fixed to the bar 95 in such spacing inwardly away from said roller when the bar is at the inner limit of its travel range as will permit initial bar travel to fully actuate the ratchet arm 99 for charging of the frame 100 with a bread slice before the said block engages the roller 111 with consequent actuation of the arm 110. After actuation of the ratchet arm 99, further outward travel of the bar 95 deriving from rotation of the cam 97 engages the block 112 with the roller 111 and swings the arm 110 with its fixedly-related trigger plate 101 about the plate hinge axis. Initial, arm-induced articulation of the plate 101 is reflected through the links 103 as a retraction of the yoke 104, against the pressure of the springs 105, downwardly within the frame 100 and into clamping engagement against the edge of a bread slice charged therein by the associated follower 88 as a consequence of preceding bar 95 outward travel and further arm-induced articulation of said plate acts through said links to swing the charged frame 100 downwardly and inwardly of the apparatus and into spaced parallelism with and registration above the webs 74 of the delivery

station, the roller 111 riding along the inclined margin of the block 112 as the bar 95 operates to displace the arm 110 and the ear 108 of the frame 100 functioning to engage the web 106 margin with the spring 109 as the frame swings away from the trough inner end. Registration of the frame 100 with and above the webs 74 is accomplished at the end of the bar 95 outward travel as marked by passage of a cam 97 lobe apex past and in engagement with the follower 96 on the inner end of said bar, and inward, return travel of said bar induced by the expansive character of the spring 98 ensues promptly as a consequence of the cam 97 lobe outline, said bar inward travel acting first to permit approach of the trigger plate 101 to the base of the frame 100 for consequent reaction of the links 103 and yoke 104 to the pressure of the springs 105 and resultant release of the hitherto clamped bread slice which now drops by gravity from the frame 100 and to the webs 74, next to permit the trigger plate 101 and spring 102 to return the frame 100 to registration with the trough inner end and to incidentally close the web 106 over the frame opening, and finally to reposition the ratchet arm 99 in end engagement with the bar notch ready for subsequent actuation of its associated roller 90.

Bread slice delivery from a unit 75 trough previously registered, in a manner that will hereinafter appear, with the delivery station is accomplished during a sixty degree rotation of the shaft 60 and while the hub 67 carrying the plates 71 is at rest with one of its associated plates registered beneath the webs 74, the lobe of the cam 97 effective to reciprocate the bar 95 being contoured to complete the bar actuating cycle as above set forth within the sixty degree rotation of said shaft 60 to which it is fixed. Ends of the webs 74 trailing in the direction of plate 71 rotation close against guide flanges 113 which rise in apposition along opposed faces of the walls 73 to partially obstruct the annular channel therebetween and to aid in proper positioning of the delivered bread slice upon the said webs, spacedly-adjacent ends of the flanges 113 coacting with the spacedly-adjacent margins of the webs 74 to define an open passage centrally of the annular channel defined by the walls 73 wherethrough the stem of a retainer 114 upstanding perpendicularly and centrally from the trailing margin of each plate 71 may freely pass as said plates traverse their orbit. It is the function of the retainer 114 to push the delivered bread slice from the webs 74 and onto the plate 71 registered thereunder as said plate is moved away from such registration and toward the next station of the apparatus, to which end portions of the flanges 113 adjacent the spaced margins thereof are reduced in height and formed with upwardly-opening notches which intersect said flanges to points below the top surface of a bread slice in place on the webs 74, and the retainer 114 is correspondingly extended laterally to provide like, oppositely-extending arms having each a depending finger formed and disposed to sweep through the flange notches and, in so doing, to engage the bread slice edge adjacent the flanges 113 and push said slice along the webs 74 to drop thence onto the plate 71 as the latter emerges from beneath said webs; the retainer 114 also serving to position and hold delivered sandwich elements relative to the plate 71 as the latter progresses from station to station of its orbit.

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Delivery of a bread slice to the initial station of the apparatus having been completed during one phase of shaft 60 intermittent actuation, said shaft comes to rest and a phase of hub 67 intermittent actuation is initiated, as above set forth, said hub actuation serving to rotate the plate 71 assembly through a sixty degree arc and to hence advance each of said plates from one and to the next station of the apparatus, the plate 71 previously at rest at the initial delivery station receiving a bread slice as it moves away from said station and coming to rest in registration with the next subsequent delivery station, while a following plate 71 moves into registration with the first station to receive its bread slice charge.

The second station of the illustrated apparatus is designed to deposit a slice or layer of lettuce, or analogous material, on the upper surface of the bread slice carried by the plate 71 just advanced from the initial apparatus station, for which purpose a preferably rectangular, open-ended housing 115 is fixedly supported to upstand directly above and between the walls 73 in registration over the second apparatus station occupied by a plate 71 when the hub 67 is at rest. The upper end of the housing 115 is normally closed by a removable and replaceable cover 116 securable to said housing by means of clamp screws 117, or otherwise, and a gear 118 is rotatably mounted centrally on and exteriorly of said cover, said gear being formed with an internally-threaded, axial bore accommodating and coaxing with a threaded stem 119 in such manner as to extend and retract said stem perpendicularly through the cover 116 as an incident of gear 118 rotation in one direction or the other, and the end of the stem 119 receivable within the housing 115 is journaled in and carries a plunger 120 slidably and non-rotatably engageable within the housing for reciprocation altitudinally thereof, said plunger constituting a presser operable to compact the housing charge and urge it to the housing lower end as the stem 119 is fed inwardly through the cover 116 as an incident of gear 118 rotation in one direction. The open, lower end of the housing 115 defines a fixed, horizontal plane immediately above the operative plane of a flat cutter or knife blade 121 reciprocable in parallel tracks 122 fixed exteriorly adjacent opposite sides of said housing above the walls 73 and radially of the plate 71 orbit, said tracks 122 extending inwardly of said orbit a distance sufficient to accommodate the blade 121 in a retracted position toward the orbit axis wherein the outer, cutting edge of the blade spacedly clears the adjacent housing 115 wall. The blade 121 may be of any specific form and construction suited to its purpose of being extended radially of the apparatus fully across the housing 115 lower, open end with severing effect through the housing charge protruding below the blade plane of reciprocation, thus severing a slice from said charge for deposit on the bread slice plate-supported between the walls 73 below said housing, and said blade is preferably track-supported adjacent its inner end to provide an unrestricted blade area adequate to engage across and close under the housing end. An actuating arm 123 fixed to and extending radially and inwardly of the apparatus from the inner end of the blade 121 has its inner end longitudinally slotted or recessed for slidable accommodation of an aligned extension 124, whereof the free, inner end is furnished with a roller 125 disposed in the operating plane and adapted to follow the

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eccentric margin of a multi-lobed cam 126 fixed to and for rotation with the shaft 60 above the orbit of the arms 70 and plates 71. It is contemplated that it may be desired, at times, to dispense with additions to the sandwich at the second station of the apparatus, hence the actuating arm 123 and its extension 124 are normally unconnected in a freely slidable relation, suitable spring means, not shown, functioning to yieldably hold the extension 124 projected relative to the arm 123 and with its roller 125 against the margin of the cam 126, and a stronger spring 127 connects between the under face of the blade 121 and a fixed frame element of the assembly to yieldably hold said blade at the inner limit of its reciprocatory range, in which relation of elements rotation of the cam 126 merely reciprocates the extension 124 in the inner end of the arm 123 without actuating the blade 121. Means reactive to selectors and controls, hereinafter to be described, is provided for interlatching the extension 124 and arm 123 at will to thereby reflect cam actuation of the said extension as operative reciprocation of the arm 123 and blade 121, said means being shown as comprising normally misaligned, registrable holes formed in the slidably-related ends of said arm and extension, a stud 128 of magnetically-responsive material of a size and length to engage simultaneously through both said holes, when registered, carried by the free end of a leaf spring 129 fixed to the under side of the arm 123 in registration with the hole in said arm and held away from entrance within the hole of the extension, and an electro-magnetic coil 130 fixedly mounted on the arm 123 upper face coaxially with and spacedly above said stud, so that, when said coil is energized said stud will be drawn upwardly against the tension of the spring 129 and will be caused to enter the hole of the extension when relative displacement of the arm and extension bring the holes of both into registration, such engagement of the stud simultaneously through the holes of both slidably-related members interlatching the latter to function as a single actuating arm; de-energization of the coil 130 permitting the spring 129 to retract the stud 128 out of the extension 124 hole for reestablishment of the slidable interrelation between the members.

A sleeve 131, of suitable depth, conformably and slidably engages over and about the lower end of the housing 115 in a normal projection downwardly below the latter, said sleeve 131 being associated for relative altitudinal adjustment with said housing by means of rack bars 132 spacedly uprising from opposite side wall margins of the sleeve along the housing side walls in meshed engagement with pinions 133 fixed to shafts 134 horizontally journaled for rotation in fixed relation with and transversely of said housing side walls, said shafts being equipped with like gears 135 on their corresponding ends remote from the blade 121, and a train of meshed gears 136, one of which is equipped with an actuating knob 137, engages in journaled relation on the outer face of the housing 115 between said gears 135 in such a manner as to simultaneously rotate said latter gears, together with their shafts and pinions, uniformly in opposite directions when the gear train 136 is actuated; such simultaneous, opposite rotation of the gears 135, shafts 134, and pinions 133, acting through the rack bars 132 to elevate or lower the sleeve 131 in any position of its altitudinal adjustment. The wall of the sleeve 131 opposed to the cutting edge of the blade

121 is cut away through a depth corresponding with the full sleeve altitudinal adjustment range to eliminate any interference with blade reciprocation across the bottom of the housing 115, and lower margins of the sleeve side walls fixedly carry complementary, parallel tracks 138, inwardly adjacent and below the tracks 122, which extend in parallel with the tracks 122 across the sleeve width and radially of the apparatus outwardly from the housing 115 and away from the blade 121 position a distance equal to or in excess of the sleeve width, said tracks 138 slidably supporting a flat, end closure plate 139 shiftable therealong into and out of closing relation with the lower end of the sleeve 131. The plate 139 is normally held in closing relation with the sleeve 131 lower end by means of an expansive coil spring 140, and in such position defines a plane paralleling and spacedly below that of blade 121 reciprocation against which the housing charge is pressed and held by the plunger 120, the spacing between the said plate 139 and blade 121 operating plane hence determining the thickness of slice to be cut by said blade from the housing charge and being variable, with consequent variation in slice thickness, through altitudinal adjustment of the sleeve carrying said plate, as above set forth. The plate 139 is shifted away from closing relation with the sleeve end and outwardly along the tracks 138 against the pressure of the spring 140 as an incident of blade 121 advance through the housing charge, to which end altitudinally-wide fingers 141 fixedly depend from forward, outer corners of the blade 121 cutting margin and project below said blade in advance of said margin to engage the adjacent edge of the plate 139 as the said blade is pushed with cutting effect through the housing charge, the blade and plate 139 hence moving together as and after said blade enters the housing 115 and maintaining an end closure for the sleeve 131 through which the housing charge may not escape, the gap between the blade cutting edge and adjacent plate margin serving to feed the severed slice of housing charge downwardly and outwardly from the sleeve to deposit on the underlying bread slice station-positioned by the plate 71; return of the plate 139 to closing relation with the sleeve end under the influence of the spring 140 following upon retraction of the blade 121 from across the housing.

Actuation of the gear 118 for maintained compression of the housing 115 charge against the closure plate 139 by means of the plunger 120 and stem 119 is had as an incident of blade 121 initial reciprocation, the charge being hence lowered and compressed just prior to slicing thereof to facilitate possible slice thickness adjustments resulting from last-minute actuation of the gear train 136. A vertical shaft 142 journaled for rotation exteriorly and centrally along one side wall of the housing 115 fixedly mounts a gear 143 on its upper end in meshed relation with the gear 118, whereby rotation of said shaft 142 and gear 143 is reflected as proportioned rotation of the gear 118 and consequent feed of the stem 119 altitudinally of the housing, and a pinion 144 freely rotatable on the lower end of the shaft 142 outwardly adjacent a sleeve 131 side wall above the associated track 122 is spring-ratchet engaged with and effective for the rotation of said shaft, the ratchet connection between said pinion and shaft being effective to transmit pinion rotation in one direction for corresponding, simultaneous shaft drive and to dis-

engage the pinion from the shaft during opposite rotation of said pinion. Spacedly parallel guides 145 fixed transversely of the sleeve 131 side wall above and below the pinion 144 shiftablely mount a frame 146 for limited travel on the sleeve side wall radially of the plate 71 orbit, and said frame 146, in turn, shiftablely mounts a rack plate 147 for relative limited travel therein radially of the said plate orbit, said plate 147 extending through and outwardly of the frame 146 end adjacent the blade 121 inoperative position, being urged to its maximum end projection from said frame 146 by means of an expansive spring 148 engaging between the frame closed end and the adjacent plate 147 end, and being equipped with a rack 149 outstanding from its exposed face in meshed engagement with the pinion 144, so that shift of the plate 147 longitudinally of its mounting frame 146 acts through the said rack 149 to rotate said pinion. The frame 146 is shiftable transversely of the sleeve 131 in the guides 145 to provide means for proportioning the throw of the rack 149, and consequent actuation of the gear 118, to the slice thickness as determined by altitudinal adjustment of said sleeve on the housing 115, and to give effect to such purpose, a pin 150 is fixed to the housing 115 lower end in position to intersect the travel path of the rack plate 147 adjacent the open end of the frame 146, said pin traversing the sleeve 131 wall and being accommodated within a vertically-elongate slot 151 intersecting said wall, traversing the adjacent frame 146 web through and being accommodated within a diagonal slot 152 intersecting said frame web, and being received at its outer end in a rectangular opening 153 intersecting the plate 147 adjacent its end projection from the frame 146. The altitudinal lengths of the slots 151 and 152, and the vertical width of the opening 153, are equal to the range of altitudinal adjustment accorded the sleeve 131, so that, as the sleeve assembly is altitudinally shifted, said fixed pin 150 may ride freely from end to end of said slots and from side of said opening, the inclination of the diagonal slot 152 resulting in a shift of the frame 146 transversely of the sleeve wall as a consequence of such sleeve altitudinal adjustment, said frame shift being away from the blade 121 inoperative position when the sleeve is lowered relative to the housing 115 and toward said blade inoperative position when the sleeve is elevated on the housing. The plate 147 range of reciprocation is determined by the length of the opening 153 therein and limiting engagement of ends of said opening with the sides of the pin 150 end, such range of reciprocation being adequate for gear 118 actuation proportioned to the maximum slice thickness obtainable through sleeve 131 adjustment. However, actual range of plate 147 reciprocation in a given setting is also determined by the plate end projection beyond the open frame 146 end, as will hereinafter appear, and since the plate 147 is urged by the spring 148 to the limit of its travel radially and inwardly of the apparatus, relative location of the frame 146 open end through the agency of the diagonal slot 152 as an incident of sleeve altitudinal adjustment serves to expose more or less of the plate 147 end in projection beyond said frame end, thereby determining a greater or less plate 147 travel in said frame and a consequent greater or less rotation of the pinion by the rack 149. An ear 154 fixedly outstands laterally from a lower corner of the plate 147 end projecting beyond the frame 146 and

overhangs the adjacent track 122 in the travel path of a detent 155 hingedly upstanding from an arm fixed to the blade 121 for travel in said track, said detent being positioned by said arm in fixed advance of the blade cutting edge and being spring-held erect to yield, at times, in either direction of its travel. The detent 155 is the rack plate 147 actuating member, for as the blade 121 is caused to move toward the housing 115, said detent moves in advance of the blade cutting edge, engages the ear 154 and moves the plate 147 inwardly of its frame 146, thereby shifting the rack 149 to rotate the pinion 144 and depress the plunger 120. The detent 155 is spring-backed sufficiently to move the plate 147 until the ear 154 engages the open end of the frame 146, thereby determining the limit of plate travel inwardly of the frame, whereupon the resistance of said engaged ear overcomes the spring tension holding the detent erect and said detent rocks on its hinge to pass under said frame 146 and the guides 145 during the remaining outward blade travel; actuation of the pinion 144 having served to compress the housing charge against the plate 139 in advance of the slice-cutting action of the blade 121. As soon as the detent 155 has cleared the ear 154 the charge-compressing operation is complete, the spring 143 returns the plate 147 to its maximum projection through the frame 146 open end while the pinion 144 ratchets on the shaft 142 in engagement with the rack 149, and during return travel of the blade 121 the said detent 155, after having come erect upon clearing the frame 146 end, ratchets against its spring past the repositioned ear 154.

The cam 126, like the cam 97, is fixed to and moves with the shaft 60, hence must complete its function of actuating the blade 121 and related mechanism during a sixty degree travel arc, to which end said cam has six identical lobes, each marginally contoured to shift the blade actuating arm assembly 123—124, the coil 130 being energized to interlatch said arm members, for full reciprocation of the blade 121 across the housing 115 lower end, with consequent compression of the housing charge and deposit of a slice of the charge material on the upper surface of the bread slice registered in the second station of the apparatus. Obviously, with the coil 130 deenergized, rotation of the shaft 60 and its cam 126 effects no operation at the apparatus second station, the disengaged blade actuating arm members merely sliding relative to each other by virtue of their telescopic association.

The next succeeding, or third, operating station of the apparatus marking a rest position of the plates 71 in their intermittent advance through their orbit is designed to deliver a slice of sandwich filling material, such as meat, cheese, salad, or the like, to the bread slice, whether or not subsequently capped with lettuce, wherewith each plate 71 is charged as it pauses at the initial apparatus station, and said third station is arranged to provide a variety of particular filling materials in a manner permitting selective control of their delivery through the agency of means hereinafter to be described.

The third station position of the illustrated embodiment is advanced sixty degrees of plate 71 assembly rotation from the lettuce-delivering, second station above described and hence is located where each plate 71 comes to rest as a consequence of the plate assembly drive after leaving said second station, and said third station

position, in analogy with the second station, is characterized by a horizontally-disposed blade 121 reciprocable in tracks 122 radially of the walls 73 above a plate 71 registered therein. The blade 121 arrangement of the third station differs from that of the second station in that the tracks 122 of the third station do not extend beyond the inner of the walls 73 and over the annular channel between said walls, and in that the blade-actuating arm 123 of the third station is a solid, non-telescopic unit between the blade and its cam follower or roller 125, so that said blade, being reactive to the cam 126, is caused to reciprocate radially of and across the channel between the walls 73 each time a lobe of said cam advances as a consequence of shaft 60 actuation.

Filling material to be delivered at the third station is housed in a plurality of receivers 115, each equipped with compressing plungers 120 and means for varying the slice thickness of its delivery, as previously described, one such receiver being provided for each kind or type of material to be furnished at the station, and said receivers, ten such being illustrated, are identically mounted and assembled in angularly spaced relation on and peripherally about a turntable 156 revoluble with and about the axis of a shaft 157 vertically upstanding from frame elements of the apparatus exteriorly of the walls 73 and in such spaced parallelism with the shaft 60 as will serve to register one of its receivers 115 over the plate 71 at the apparatus third station position when the said turntable is rotated about its axis to an appropriate extent; such mounting of the third station receivers 115 making possible selective registration thereof in delivering relation with the plate 71 at the third station. The turntable 156 passes marginally over and in clearing relation above the outer of the walls 73 to carry a selected one of its receivers 115 into cooperating relation with the blade 121, and each of said receivers carries fixedly associated portions of the tracks 122 adapted for registration with the said track portions supporting said blade in its retracted position, so that, when any one of the third station receivers 115 is registered for delivery to the plate 71 at said station, the third station blade 121 may reciprocate along the registered track 122 portions under the influence of the cam 126 to sever a slice from the filling material wherewith the receiver is charged in the same manner and to the same ultimate effect described in connection with the lettuce-delivering receiver 115; the travel of said blade actuating the receiver compressing plunger and receiver lower end closure to maintain the receiver charge in condition for slice delivery, as above set forth. When desired, or when warranted by the character of the receiver charge, the cutting margin of the blade 121 may have the form of a thin wire 158 stretched between advanced side margins of said blade in the plane and spaced ahead of said blade in the direction of its cutting action.

Means reactive to the actuation of the selectors and controls hereinafter to be described is provided in such controlling relation with the angular disposition of the turntable 156 as to selectively register the receivers 115 of said turntable with the apparatus third station, said means being illustrated as comprising a pinion 159 on the shaft 157 in meshing relation with a horizontally-reciprocable rack bar 160, a link 161 pivoted at one end to fixed frame elements of the apparatus in generally perpendicular relation

with and in the plane of said bar 160, a hinge connection between one end of said bar 160 and a point on said link remote from its pivotal mounting, and a plurality of like solenoids 162, corresponding in number with the number of receivers 115 carried by the turntable 156 and graduated as to respective armature travel, so arranged in parallel in a bank secured to the apparatus frame elements and in respective connection of their movable armatures with points spaced along the link 161 as to separately swing said link, when individually energized, a distance effective through the rack bar and pinion 159 to position the receiver 115 of the turntable corresponding in number with the energized solenoid in registration with the third station position. To accommodate link 161 oscillation responsive to energization of any given solenoid 162 without disturbing the potential operating dispositions of the other solenoids and their elements, it is convenient to provide each solenoid coil with a tubular, or sleeve-type, armature 163 shiftable axially of the coil core and to connect each such armature with the link 161 by means of a stem 164 slidable axially through the associated armature and furnished with a headed terminal 165 engageable against the armature end within its coil when the link 161 is positioned at that extreme of its range of oscillation marking non-registration of any turntable receiver with the third station of the apparatus. A stop in fixed association with frame elements of the apparatus may be positioned for engagement by the link 161 at that limit of link oscillation characterized by receiver and third station non-registration, such stop-limited link position determining full extension of all the armatures 163 into potential full-throw relation with their respective coils 162 by virtue of engagement between their stem heads 165 and the inner armature ends, and a suitable spring may operatively engage with the link 161 to yieldably hold said link against said stop and to automatically return the rotatable receiver assembly to inoperative relation with the third station when all of the coils 162 are deenergized; a stop at the end of each coil 162 core remote from the link 161 serving to limit travel of the associated armature responsive to coil energization in a manner effective to suitably register the appropriate receiver with the blade and track elements of the third station. Thus, a coil 162 being energized to position a selected receiver 115 in operative registration with the third station, actuation of the cam 126 through a sixty degree arc of its intermittent travel operates to deliver a slice from the charge of the registered receiver to the upper surface of the sandwich elements previously delivered to and carried by the plate 71 at rest in said station. As should be manifest, operation of the apparatus third station is accompanied by simultaneous operation of the second and first stations for the charging of the plates 71 at rest therein with the material characterizing said stations.

After sixty degree actuation and operation of the apparatus third station as above set forth, the cam 126 comes to rest and the hub 67 is rotatively advanced to swing the plate 71 assembly through a sixty degree arc for registration of the plate just charged at the third station with the fourth station of the apparatus, the successively trailing plates of the assembly being correspondingly advanced. The fourth station of the illustrated apparatus is designed to deliver

a second slice of filling material, such as meat, cheese, salad, or the like, selectively the same as or different from that delivered at the third station, to the sandwich elements previously deposited upon the plate 71 registered therein, thereby permitting selective variation of the quantity, type, and combination of filling material layers comprised in the ultimate sandwich. Through the agency of the selectors and controls hereinafter to be described, the apparatus fourth station may be rendered either operative or inoperative, so, at the will of an operator evidenced through manipulation of the selectors and controls, the sandwich under development on a given plate 71 may pass from the third station and through the fourth station without addition at the latter, or may receive a supplemental charge of filling material in said fourth station. The functions of the fourth station being identical with and merely additional to those of the third station, said fourth station is characterized by a blade 121, receivers 115 carried by a turntable 156, a bank of solenoids 162, and turntable-actuating linkage advanced sixty degrees of the plate 71 orbit from the like elements of the third station for reaction to cam 126 actuation in the same manner and with the same effect as said third station elements; the views of the drawings illustrating one structural and operatively inconsequential difference between the third and fourth stations in that the latter is shown with but seven, instead of ten, receivers 115 and turntable-actuating solenoid coils 162, the number of such elements in a given station being clearly a matter of choice. Thus, with the plates 71 at rest in their respective stations and a given setting of selectors and controls, sixty degree advance of the cam 126 operates the fourth station, while the preceding stations are simultaneously operated, to deliver a second slice of filling material to the sandwich elements on the plate registered therein, and with a different setting of selectors and controls said fourth station remains inoperative and the plate 71 registered therein merely pauses with its charge as an incident of its rotative cycle.

Delivery and assembly of the elements comprising a given sandwich is completed at the fifth station of the apparatus, advanced sixty degrees in the orbit of plate 71 rotation from the fourth station, where a slice of bread corresponding in type with that delivered to a particular plate 71 at the initial apparatus station is delivered to said plate and superposed in closing relation over the plate charge when said plate pauses at and in registration with the fifth station, to which end the elements characterizing said fifth station are essentially identical with those of the initial station and include spaced webs 74, a unit 75, and the associated means and agencies for positioning said unit and selectively delivering a bread slice therefrom and to the webs 74, all as previously described; the hereinafter-described selectors and controls being correlated to effect delivery of bread slices of like type from the units 75 to a given plate 71 as the latter registers successively with the first and fifth stations of the apparatus. Since a charge has been built up on each plate 71 approaching the fifth station, the webs 74 at said latter station are elevated along the walls 73 sufficiently to permit the plate charge to pass freely therebelow and the gated members 113 rise from trailing ends of said webs to cooperation with an upper, lugged

arm of the member 114 in a manner to permit the latter to push the delivered bread slice from said webs and into closing relation over the plate 71 charge as said plate moves away from the fifth station and toward the final, or sixth station of the apparatus. As should be apparent, operative elements of the fifth station are reactive to rotation of the cam 97, through the agency of an arm 95 and follower 98, exactly as the like elements of the first station react thereto, said cam having multiple, like lobes arranged to simultaneously operate the first and fifth stations when the shaft 60 is actuated through each sixty degree arc of its intermittent rotation.

At the sixth station of the apparatus, advanced sixty degrees from the fifth station and hence trailing the initial station by sixty degrees, the completed sandwich is removed from the plate 71 whereupon it has been assembled, divided, trimmed if desired, and transferred to a serving plate which is, in turn, removed to a ready shelf from which it may be taken by a customer or attendant, thus completing the operative cycle of the apparatus and clearing the previously-charged plate 71 for subsequent, repetitious travel through its rotational orbit.

The first operation at the sixth station is transfer of the assembled sandwich from its plate 71 to a location where it may be divided and trimmed, and such operation is automatically accomplished while the plates 71 are at rest in their respective stations through the agency of a pusher 166 fixed perpendicularly to one end of an arm 167 reciprocable in suitable fixed guides radially of the plate 71 orbit just above the orbital plane of the plate arms 70 and through registered openings in the walls 73 marking the sixth station position, a slide trough 168 leading radially and outwardly from the opening in the outer of said walls 73 with its substantially horizontal floor in the plane of the plate 71 registered in the sixth station and its outer end disposed in closely spaced relation with and to deliver to the upper surface of a flat, rectangular block 169 fixedly pedestal-supported from frame elements of the apparatus. The pusher 166 has its lower margin elevated to just clear the top surface of the plate 71 at the sixth station, so as to engage against edges of both upper and lower sandwich bread slices on said plate when the arm 167 is caused to move radially and outwardly of the apparatus, and is dimensioned to pass freely through the wall 73 openings and along the trough 168 as said arm reciprocates, and said arm, spring-loaded for yieldable retention at the inner limit of its range of reciprocation, engages through a roller on its inner end with and reacts to the eccentric margin of a cam 170 fixed to and for rotation with the shaft 60 between the cam 126 and the orbital plane of the plate arms 70. The cam 170 has six identical lobes, each effective through a sixty degree rotation of the shaft 60 to extend the arm 167 with its pusher 166 to the outer limit of its range of reciprocation and hence across the channel between the walls 73 and fully along the trough 168 and to the adjacent side of the block 169, such arm and pusher travel serving to slide the assembled sandwich from the plate 71 at the sixth station to supported position on the block 169 upper surface, and since cam 170 rotation occurs when the plates 71 are at rest in their respective stations, each plate 71 is successively cleared of its charge as it comes to rest at the sixth station of the apparatus and is hence

conditioned for repetition of its transit through the charging stations.

To support, guide, and position the elements operable to divide and trim the completed sandwich transferred to and positioned upon the upper surface of the block 169, a rectangular, open-ended housing 171 is fixed to frame elements of the apparatus to upstand with its walls vertical in registration with and immediately above the position of a sandwich delivered to said block by the pusher 166, the spacing of said housing lower end above the block being sufficient to clear an assembled sandwich moved thereunder and the open end outline of said housing being sized to the dimensions desired for a trimmed sandwich. A rectangular trimming blade assembly 172 is formed as a hollow, open-ended unit whereof the lower margins are sharpened to cutting edges, and said unit is telescoped within and to slide vertically relative to the housing 171 between engagement of its lower cutting edges with the upper surface of the block 169 and retraction of said cutting edges within the housing lower end, springs 173 engaging between lugs respectively fixed to said housing and unit serving to yieldably maintain the latter at the upper limit of its reciprocatory range and hence in clearing relation with a sandwich on the said block. Interiorly of the trimming blade assembly 172, a dividing blade 174, having its lower margin sharpened to a cutting edge, is disposed to span diagonally between opposite corners of said assembly in a size and relative clearance permitting of its free reciprocation vertically within said assembly between cutting edge engagement against the block 169 upper surface and retraction of said edge within the housing 171 lower end, and retractile springs 175 engaging between upper edge corners of the blade 174 and intumed ears fixed to the housing upper end yieldably maintain said blade at the upper limit of its range of reciprocation. Obstructing open, lower end areas of the blade assembly 172 on opposite sides of the blade 174, complementary, triangular, compressor blocks 176 are mounted to slide relative to said assembly and blade in an independent reciprocatory cycle toward and away from the block 169, it being the function of said blocks 176 to moderately compress and hold the sandwich on the block 169 during cutting action imposed thereon through the assembly 172 and blade 174, either or both, said blocks 176 being normally and yieldably maintained elevated within the housing 171 lower end by means of retractile coil springs 177 rising therefrom to an attachment presently to be described.

Operative reciprocation of the elements 172, 174, and 176 relative to a sandwich on the block 169 is an automatic cyclic function deriving from the intermittent rotation of the shaft 60, to which end a bevel gear 178 fixed to and for rotation with said shaft above the cam 126 meshes with a bevel pinion 179 on the inner end of a shaft 180 horizontally journaled for rotation radially of the apparatus to extend in spaced relation above, across, and beyond the upper end of the housing 171, the gearing of said shaft 180 to the shaft 60 being such as to effect a complete revolution of the former for each sixty degree, intermittent actuation of the latter. For reasons later to be developed, it is expedient that drive through the shaft 180 to elements operable thereby be interrupted save under conditions reactive through the selectors and controls hereinafter described, hence said shaft is divided into inner and outer

sections, the first of which is in constant-driven relation with the shaft 60, operatively interconnectible as a single driven unit through the agency of a normally disengaged, electro-magnetic clutch 181 upon energization of the clutch coil as a consequence of circuit closing by the selectors and controls. The outer section of the shaft 180 bridging above and across the housing 171 supports loose collars 182 to which the upper ends of the springs 177 connect to complete the compressor block elevating function of said springs, and also carries like cams 183 rotatable therewith on opposite sides of the collars 182 in eccentric margin, actuating engagement with stems 184 fixedly upstanding from the compressor blocks 176, the association of cams 183 and stems 184 being such as to depress the blocks 176 into moderate compressing relation with a sandwich on the block 169, to maintain such sandwich compression for a time, and to then permit the springs 177 to elevate said blocks for full relief of their compressive effect, all within one complete revolution of the shaft 180 outer section. Between the collars 182 the shaft 180 outer section fixedly mounts a cam 185 in eccentric margin, actuating engagement with a stem 186 fixedly upstanding centrally from the blade 174 upper margin, the contour of said cam 185 being such, and so related to the cams 183, as to depress the blade 174 into dividing relation through the sandwich on the block 169 and to permit return of said blade into retracted relation within the housing 171 while the compressor blocks 176 are extended into engagement with the sandwich, the dividing action of the blade 174 hence being had during a relatively short portion of one shaft 180 revolution.

Trimming of the sandwich through the agency of the blade assembly 172 is a selective function determinable through the hereinafter described selectors and controls and is not necessarily an accompaniment of the dividing operation, hence the drive for actuating the assembly 172, while deriving from the shaft 180, is susceptible of separate control. As shown, a gear 187 fixed to the shaft 180 outer section meshes with a gear 188 of corresponding size fixed to a shaft 189 journaled for rotation in spaced parallelism with the shaft 180 outer section to extend over and across the housing 171, said shaft 189 being divided into inner and outer sections, whereof the first is constantly driven whenever the shaft 180 outer section rotates, interconnectible as a single driven unit by means of a normally-engaged, electro-magnetic clutch 190 reactive upon energization of its coil to disengage and free the shaft 189 sections for independent relative rotation. Thus, the sections of the shaft 189 are normally interengaged to rotate as a single, driven unit in response to shaft 180 outer section rotation, but the drive to the shaft 189 outer section may be selectively interrupted through energization of the clutch 190 coil by means of selector and control manipulation. The shaft 189 outer section carries like cams 191 spaced apart in identical setting to overhang the side margins of the blade assembly 172 in eccentric margin, actuating engagement with the ends of stems 192 upstanding fixedly from said margins, so that, the contour of the cams 191 being similar to or the same as that of the cam 185, rotation of the shaft 189 outer section, which can occur only simultaneously with shaft 180 outer section rotation, acts through said cams 191 to depress the blade assembly 172 into trimming relation through margins of the compressed sandwich

on the block 169 as such compression is maintained and substantially simultaneously with the dividing action of the blade 174.

Transfer of the completed sandwich from the block 169 to a serving plate and subsequent shift of the so-charged plate to a position of ready availability are automatic functions of the apparatus deriving from rotation of the shaft 180 outer section, to which end said shaft outer section is extended radially of the apparatus and outwardly beyond the block 169 and related elements to fixedly mount a bevel gear 193 on and for rotation with its outer end. A shaft 194 journaled for rotation in parallelism with the shaft 60 adjacent the outer end of the shaft 180 outer section fixedly carries a bevel gear 195 in meshed engagement with the gear 193 to reflect rotation of said shaft 180 outer section as corresponding rotation of the shaft 194. A shaft 196 rotatable in spaced parallelism with the shaft 194 fixedly carries a gear 197 meshable with the toothed portion of a mutilated gear 198 fixed to the shaft 194, so that each revolution of said latter shaft acts through said gears 197 and 198 to effect a partial rotation, or angular displacement, of the shaft 196, and spring means 199 suitably engages the shaft 196 for return of the latter to an initial position of rest following each angular displacement effected through the agency of the mutilated gear 198. Closely adjacent the side of the block 169 away from the shaft 196 position, a plurality, in this instance three, of like, threaded stems 200 rotatably upstand from frame elements of the apparatus in a uniform radial and angular spacing relative to a common center and alike slidably engage through tubular bosses 201 fixedly depending perpendicularly from a carrier 202, thereby mounted to reciprocate on and longitudinally of said stems 200 in maintained horizontal disposition of its upper surface. A gear 203 rotatably centered relative to the stems 200 meshes with pinions 204 fixed to lower ends of said stems, so that rotation of said gear 203 acts to simultaneously rotate all of said stems a like amount in the same direction, and a mutilated gear 205 is effective through a ratchet pinion 206 and associated drive 207 to rotate said gear 203, and consequently the pinions 204 and stems 200, at each angular displacement of the shaft 196 effected through the gears 197 and 198 at each revolution of the shaft 180 outer section. It is the function of the carrier 202 to support a stack of serving plates 208 with the upper element of the stack positioned to receive a completed sandwich from the block 169 and to elevate successive elements of the stack into sandwich-receiving position as the superposed elements are utilized and removed, and for such purpose each of the bosses 201 is equipped with means operatively engageable with the threads of the associated stem 200 wherethrough stem rotation may be applied to effect elevation of the carrier. As shown, an end-threaded detent 209 is slidably engaged through a wall of the boss 201 in a manner to operatively mesh its end threads with those of the associated stem 200, at times, and is linked at its outer end to an arm 210 hinged to the boss 201 for oscillation in a vertical arc in a manner to reciprocate its detent 209 relative to the boss 201 into and out of end thread meshing engagement with the associated stem 200, the frictions inherent in the construction under a charge of plates on the carrier 202 being adequate to normally re-

tain the detent 209 in meshed, operative engagement with the stem threads, and an upper end extension of the arm 210 projects marginally past and above the top surface of the carrier 202 a distance sufficient to engage a fixed frame element of the apparatus when the carrier has reached the upper limit of its altitudinal travel, as determined by transfer of the last plate stack element from said carrier, and thereby oscillate said arm to retract the detent 209 away from meshed engagement with the stem 200 threads, thus breaking the connections linking the carrier to the stems and permitting said carrier to slide on and downwardly along the stems to its lowermost position. In the lowermost position of the carrier 202 relative to the stems 200, the lower end of the arm 210 engages with and trips a switch 211 effective to halt operation of the apparatus, so that, whenever the charge of plates 208 on said carrier has been exhausted, the carrier is released from threaded engagement with the stems 200 and slides freely on said stems to its lowermost position where it trips the switch 211 and holds the apparatus inoperative until the carrier has been recharged and threadedly reengaged with said stems in an elevation freeing the said switch, the construction of the arm 210 facilitating manipulation thereof to operatively engage the detents 209 with their stems 200 at such carrier elevations as will dispose the upper plate 208 of the stack in sandwich-receiving relation with the block 169. Obviously, the carrier 202 being charged and suitably positioned with its detents 209 engaging the threads of the stems 200, cyclic rotation of the shaft 190 outer section is effective through the means and connections above described to elevate said carrier and its stack for sandwich-receiving correlation of successive stack elements with the block 169 as needed, the carrier-elevating means being automatically coordinated to position the uppermost plate 208 of the stack for reception of a sandwich from the block 169 as an incident of charged plate removal completing a preceding cyclic phase.

Transfer of the completed sandwich from the block 169 to the uppermost element of the plate stack is accomplished through the agency of a spatula 212 fixed to, rotatable with, and projecting in a horizontal plane radially from the shaft 196 in a disposition effective to sweep the outer end thereof across and closely adjacent the block 169 top surface when said shaft is angularly displaced as above described, the association of elements responsive to shaft 190 outer section rotation being such as to move the spatula 212 free end into engagement between the block 169 top surface and the completed sandwich thereon after said sandwich has been trimmed and divided and just before the compressor blocks 176 are retracted away from the sandwich. A pusher 213 on and slidable in guided relation longitudinally of the spatula 212 is formed with a right-angle yoke on its outer end disposed to receive and at times engage with a corner of the completed sandwich on the block 169 and is normally spring-held in retracted, sandwich-clearing position on said spatula, said pusher reacting to cam means, hereinafter to be described, as the spatula is engaged beneath the completed sandwich and moving longitudinally and outwardly of the spatula to embracing engagement with the adjacent sandwich corner, in which position it retains the sandwich on and for travel with the spatula free end as the latter sweeps across and

beyond the block 169, and finally clearing the sandwich from said spatula for deposit on the positioned uppermost plate 208 as said spatula reaches the limit of its swing in registration with said plate. To actuate the pusher 213 in the manner and for the purposes above set forth, a sleeve 214 about and rotatable relative to the shaft 196 above the spatula 212 fixedly carries a gear 215 in meshed engagement with a like gear 216 fixed to the shaft 194, whereby each revolution of the latter is productive of one revolution of the sleeve 214 in the opposite direction, and a cam 217 fixed to and projecting radially from its lower end immediately above the spatula fixed end in position for actuating engagement of its eccentric margin against a follower 218 upstanding from the inner end of said pusher, the cam angular disposition and outline being correlated with the sleeve 214 and shaft 196 drives to effect actuation of the pusher 213 in the manner, at the times, and for the purposes above set forth.

As the spatula 212 is caused to deliver its charge to the uppermost plate 208 and passes beyond said plate, the carrier-elevating train is brought into play as a consequence of shaft 196 angular displacement and functions to elevate the charged plate 208 above the block 169 top surface and into the travel path of a plate-shifter in the form of an arm 219 fixed to and radially of the shaft 196 in trailing relation with the spatula 212, said arm 219 being furnished with an arcuate plate 220 hinged to its free end for self-accommodating engagement against the margin of the charged plate and consequent shift of the latter from the plate stack and onto a ready shelf 221 as a final incident of shaft 196 angular travel under the driving influence of the mutilated gear 198.

The optional features of the apparatus determinative of the kind of bread, the presence or absence of lettuce, the nature of first filling material, the presence or absence and nature of second filling material, and the trimmed or untrimmed condition, characterizing a given sandwich combined and prepared by the apparatus being all arranged for selective regulation and control through means responsive to directed flow of electric current, it is feasible to provide a control unit receptive of simple, manually-imposed indications of the various options and variations or multiples thereof in such synchronous relation with the apparatus heretofore described as results in automatic production of the sandwich combinations, choices, and number charged into the unit, and a control unit effective as above set forth is illustrated and hereinafter described in operative association with the apparatus hereinbefore set forth.

In position for operative association with the assembly above described, conveniently adjacent the ready shelf 221, a suitable framed enclosure, which may or may not combine with the frame elements 61, operatively mounts and supports similar, upper and lower shafts 222 journaled for rotation therein in spaced parallelism with their axes horizontal and preferably in the same vertical plane. Spaced apart on and fixed adjacent the ends of each shaft 222, like sprockets 223 align in vertically coplanar pairs for operative engagement with endless chains 224 whereby both ends of the parallel shafts 222 are interengaged for synchronous rotation, and a succession of channel bars 225 fixedly engage at their ends with and bridge between the chains

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224 in a uniform spacing along said chains and in parallel with the shafts 222 to form an endless ladder susceptible of travel about and between the sprockets 223. The number of bars 225 determines the capacity of the control unit in terms of number of sandwiches chargeable by indicated selections therinto, and should hence be provided in the desired uniformity of spacing in such number as to provide six bars in addition to those corresponding with the desired unit capacity in the uprise span of the ladder between the shaft 222 axes. A feature of the control unit is feed of the ladder comprised from the chains 224 and bars 225 in such synchronism with the intermittent orbital travel of the plates 71 as serves to effect step-by-step upward advance of the bars 225 in the uprise span of the ladder so as to upwardly shift each bar in said uprise span one ladder interval for each sixty degree advance of the plate 71 assembly, and such feed is accomplished through the agency of a ratchet-toothed gear 226 fixed to one end of the lower shaft 222 in cooperating relation with an actuating detent 227 mounted to swing on said shaft and held against reverse rotation by means of a spring-loaded latch 228. The free end of the detent 227 operatively engages with an end of a thrust rod 229 which is linked through a bell-crank 230 with and for reaction to reciprocation of a rod 231 longitudinally shiftable radially of the shaft 60, and a follower on the inner end of said rod 231 reacts to the eccentric margin of a six-lobed cam 232 fixed to and rotatable with the sleeve 67 in such manner as to swing said detent 227 for one interval upward feed of the ladder uprise span through the agency of the gear 226 at each sixty degree rotation of the sleeve 67 marking station-to-station shift of the plates 71.

Each bar 225 controls and determines the selective features characterizing a given sandwich produced by the apparatus in accordance with the options manually imposed on the control unit, to which end each said bar is similarly furnished with a suitable number of like selector fingers 233 correspondingly pivoted at one end each thereto and projecting in spaced relation outwardly of the ladder or bit therefrom for individual oscillation through limited arcs transversely of the ladder, the mounting of each finger 233 on its bar 225 being such as to supply a moderate friction adequate to maintain the finger in any adjusted relation with the bar until acted upon by a positive finger-shifting force. As illustrated, the fingers 233 are arranged to normally extend in nonactuating relation with the elements and circuits they respectively control perpendicularly from their associated bars 225, to which position and relation the fingers are automatically shifted, regardless of prior adjusted disposition, as the bars 225 successively pass over the upper sprockets 223 by means of deflectors 234 fixedly depending and so inclined relative to the descending paths of the said fingers as to return any previously displaced such elements to their normal perpendicular projection from their mounting bars, in which disposition said fingers remain until they enter the uprise side of the ladder orbit and encounter agencies effective for their displacement therefrom. Each of the fingers 233 is arranged to close a switch forming part of a control circuit susceptible of later completion, and to close said switch as an incident of finger displacement out of normal perpendicular projection from its mounting bar, and such a switch is shown in association with each finger

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233 as consisting of a leaf-spring contact element 235 fixed to one side of and movable with the finger in position to close against a contact post 236 spacedly paralleling the finger normal position in a fixed mounting on and through the finger-supporting bar 225 effective to provide a contact button 237 protruding from the inner face of the associated bar, the arrangement of switch elements being such as to complete a path for electric current through the spring 235 and post 236 to the button 237 when the associated finger 233 is arcuately shifted to bring the contact end of said spring into engagement against the side of the post end remote from said button. One finger 233 and associated switch being provided on each bar 225 for each of the optional features of the apparatus, twenty-three such units would be required in spaced succession longitudinally of each bar of the illustrated embodiment wherein the optional features include four choices of bread, ten choices of first sandwich filling, seven choices of second sandwich filling, election as to lettuce, and election as to trimming of the sandwich.

Transversely of and inwardly adjacent the ladder orbit at the upper end of the ladder uprise span, a panel 238 is fixed in a length adequate to bridge the assembly of contact buttons 237 carried by each bar 225 and in a depth sufficient to span the six ladder bar intervals at the upper end of the straight uprise travel, and said panel carries contacts 239 in position for wiping engagement with the buttons 237 of the successive bars 225 as the latter complete their step-by-step travel through the final intervals of the ladder uprise movement, such engagement of the contacts 239 with the buttons 237 completing circuits to and for actuation of the apparatus optional features at each of the so-engaged bar stations where a finger 233 has been displaced to close its associated switch. The contacts 239 are patterned on the panel 238 to close circuits to and for actuation of the apparatus optional features in a progressive relationship corresponding with the station-to-station travel of the plates 71, so that the selector fingers 233 of a given bar 225 may control all of the operations incident to the development of any one sandwich on a corresponding plate 71 as the latter effects its cyclic traverse through the apparatus stations, the ladder orbital movement being correlated, as above set forth, with the plate travel to advance a bar 225 one interval upwardly across the panel 238 each time the plate 71 assembly is advanced one station. Thus, the first plate station of the apparatus providing for selection as between four types or kinds of bread, four contacts 239, each included in a circuit serving one of the coils 84 wherethrough the position of the first bread-carrier may be regulated, are spacedly aligned adjacent the lower margin of the panel 238 for engagement with four of the buttons 237 on a bar 225 as the latter first rises into registration with said panel; the second plate station providing election as to the deposit of lettuce, a single contact 239 included in a circuit serving the coil 139 of the slicing blade arm at said second station is mounted on the panel 238 laterally out of alignment with and above said first four contacts in position to engage another of the buttons 237 of a bar 225 as the latter is advanced one interval upwardly along said panel and away from its button-engagement with the first four panel contacts 239; the third plate station providing for selection as between ten types or kinds

of filling material, ten contacts 239, each included in a circuit serving one of the solenoids 162 determinative of receiver 115 registration with the apparatus third station, are spacedly aligned on the panel 238 in laterally offset relation with and above the preceding contacts for engagement with ten other of the bar 225 buttons as said bar is advanced another interval upwardly along the panel and away from its preceding button engagement; the fourth plate station providing for selection as between seven types or kinds of filling material is represented on the panel 238 by seven spacedly aligned contacts 239, each included in a circuit serving one of the solenoids 162 determinative of receiver 115 registration at said fourth station, in laterally offset relation with and above the preceding contacts for engagement with seven other of the bar 225 buttons 237 as said bar is advanced yet another interval upwardly across the panel and away from its preceding button engagement; the fifth plate station providing for selection as between four types or kinds of bread in correspondence with the election made at the first plate station is represented by four contacts 239 spacedly aligned on the panel 238 in vertical registration with the first, or lowermost, of the panel contacts and at one interval spacing above the preceding contacts for engagement with the bar 225 buttons 237 first engaged as said bar started its panel traverse, the second four-unit bank of contacts 239 serving the coils 84 of the bread-carrier at the fifth plate station in an operative arrangement corresponding with that at the first plate station and being engaged as the bar 225 is moved upwardly away from its preceding button engagement; and the final, or sixth, plate station providing for election as to trimming of the sandwich there positioned is represented by a single contact 239 included in a circuit serving the clutch 181 laterally offset from and spaced on the panel 238 one interval above the preceding contacts for engagement by the final, hitherto unemployed, button 237 of the bar 225 as the latter is advanced its final interval upwardly along said panel away from its preceding button engagement. The clutch 181 in controlling relation with the automatic drive to the plate elevator and sandwich dividing, trimming, and transferring means at the final station of the apparatus being normally disengaged and it being desirable to engage said clutch only when a sandwich is present at and for delivery from said sixth station of the plate 71 orbit, thereby to obviate the transfer of empty serving plates from the elevator to the ready shelf, it is expedient to connect the circuit serving said clutch 181 for completion through the finger 233 switches where-through selective actuation of the bread-carriers is had, functioning of said bread-carriers being a reliable indication of the presence of a sandwich on the plate 71 moving in synchronism with a given bar 225, and to that end a third four-unit bank of contacts 239 may be mounted on the panel 238 in vertical registration with the preceding two such banks and in the upper, final interval of said panel containing the single contact 239 in the circuit serving the clutch 181, the contacts 239 of said third four-unit bank being included in parallel in a circuit serving the clutch 181, so that, any one of the fingers 233 controlling a bread-carrier-actuating circuit being operative on a given bar 225 to effect bread slice delivery, advance of said bar to the panel interval corresponding with sixth station position of the corresponding plate 71 will act through the closed switch of said controlling finger to com-

plete the circuit to the clutch 181 and thereby establish drive to the sandwich dividing, trimming, transferring, and delivering agencies, irrespective of the circuit condition to the clutch 181, determined at the same panel interval.

Selective displacement of the fingers 233 for closing of their associated switches in advance of bar travel across the panel 238 and for the conditioning of subsequently-completed circuits in accordance with options manually imposed upon the control unit is a function of triggers 240 pivoted to and projecting at each end beyond an altitudinally-reciprocable member 241. The member 241 is disposed in spaced parallelism with the shafts 222 and is end-engaged in fixed guides to move freely in a vertical plane spacedly and outwardly paralleling the uprise span of the ladder comprised from the chains 224 and bars 225 and the triggers 240 are mounted on said member in such number and spacing as serves to align one such trigger with each normally-positioned finger 233 of a bar 225 when the triggers are perpendicular to the member, in which relation said triggers are normally held by individual springs 242. Adjacent ends of aligned fingers 233 and triggers 240 are closely spaced and suitably beveled to permit of their freely passing without interengagement during relative travel of ladder assembly and supporting member, but the finger 233 and trigger 240 end bevels are such as to produce an overlap of the trigger end relative to the corresponding finger end when the trigger is arcuately displaced about its pivot to swing its inner end in the direction of the post 236 of the associated finger, such overlap reacting through the trigger and finger end bevels to correspondingly displace the finger free end and effect closing of its associated switch when the so-displaced finger is moved with its member 240 downwardly past its complementary finger. Outer end margins of the triggers 240 slidably engage and are held by their springs 242 against faces of vertically-disposed webs 243 outwardly adjacent and paralleling the member 241 travel path, one such web being provided for each trigger 240, and each web 243 is pivoted at its opposite ends in fixed frame elements for oscillation about an axis adjacent its inner margin in an amount effective for finger-actuating displacement of the trigger 240 slidably engaging therewith. As will be apparent, the spring 242 tends to hold each trigger and associated web 243 at that limit of web oscillation permitting end-clearing alignment of the trigger with its complementary finger 233, and to return the elements to such relation, the trigger 240 being uniformly reactive to its web 243 throughout the full range of member 241 reciprocation, and latch means 244 between one end of each web 243 and adjacent fixed frame elements operates to secure and hold said web at that other limit of its oscillation productive of finger-actuating trigger displacement, said latch means automatically functioning to inhibit web 243 return when said web has been oscillated to displace its trigger. In and operatively through a face of the control unit outwardly and spaced paralleling the member 241 reciprocatory plane, spring-loaded actuators 245 are grouped, preferably in transverse alignment and in suitable association with indications carried by said face, to provide one actuator for each web 243 and hence one for each trigger 240 and complementary vertical line of fingers 233, and inner ends of said actuators 245 are equipped with wedge-blocks 246 engaging the adjacent margins of their respective webs 243 in

such manner as to translate inward actuator travel into associated web oscillation to a degree effective to latch the web in finger-actuating displacement of its trigger 240. Thus, regardless of trigger 240 and member 241 altitudinal disposition, manual pressure against a selected actuator 245 operates through its wedge-block 246 and web 243 to angularly displace the associated trigger 240 into actuating relation with its complementary line of fingers 233 and to latch said web and trigger in such relationship, release of the web latch 244 permitting return of the trigger and web elements into normal end-clearing relation of trigger and finger.

Since a single bar 225, through the agency of its circuit-completing selector fingers 233, controls the development of a given sandwich as an incident of bar travel across the six intervals of the panel 238, an initial, or upper limiting, position of the member 241 travel range would be that in which the triggers 240 carried by said member end-register with and are disposed to potentially actuate the fingers 233 of the bar 225 marking the interval next below that of first panel registration, and stops are provided to inhibit upward travel of said member 241 beyond said position. Beyond the end elements terminating the trigger bank carried by the member 241, spring-type detents 247 are fixed to and project perpendicularly and inwardly from ends of said member for ratcheting engagement of their free ends over and with opposed ends of the bars 225, the said detents 247 being of a character to yield as the member is urged downwardly and ratchet over the bar 225 ends, the ladder including said bars being held against reverse travel by the latch 228, and to engage with the bar 225 marking the lower limit of member downward shift and return said member to its upper limiting position when the shifting pressure thereon has been relieved.

The optional characteristics of a given sandwich having been registered through the actuators 245 as displacements of the appropriate triggers 240 and webs 243, such determinants are transferred to the selector fingers 233 of the next available bar 225 for reflection thence through control of the apparatus automatic operations by downward shift of the member 241 through a space corresponding to one interval of ladder travel, thereby displacing and closing the associated switches of the selector fingers past which the displaced triggers are moved, the number of identical sandwich indications so charged into the control unit being equal to the number of ladder intervals, or bars 225, past which said member is downwardly moved with its triggers set to actuate successive fingers, and means are provided for effecting selective, proportioned, downward shift of said member to any desired extent within the capacity of the control unit.

A depressor arm 248 is hinged at one end to a side of the control unit for actuation through a vertical arc paralleling and inwardly adjacent the control unit face, and said arm extends from its hinge connection upwardly and inwardly of the control unit between the webs 243 and control unit face to terminate in a free end at the approximate width center of the unit and normally above the upper limiting position of the member 241. A head 249 is mounted to reciprocate altitudinally on vertically-upstanding guides centrally of the control unit width between the unit face and the webs 243 and hence directly beneath the free end of the arm 248, and springs 250 yieldably support said head to normally

maintain it at the upper limit of its reciprocatory range. Like detents 251 are hinged to and inwardly adjacent the ends of the head 249 to swing in depending relation with their hinge axes through the head inner wall between concealed relation within said head and projection of their lower, inner corners beyond said head inner wall, springs 252 serving to normally retain said detents concealed within the head, and a plate 253 hinged to the head 249 above said detents in position to engage with and beneath the free end of the arm 248 is toggle-linked to said detents in a manner to upstand angularly from said head when the detents are retracted therein by the springs 252 and to close toward said head with consequent projection of the detents therefrom when pressure is applied to shift said arm free end downwardly toward said head; such downward pressure shift of the arm 248 free end functioning to first close the plate 253 toward the head 249 for projection of the detents 251 through the head inner wall and to subsequently depress the head along its guides against the pressure of the springs 250 with said detents in maintained projection. Vertically upstanding in fixed relation and for travel with the member 241 between the head 249 inner face and the plane of the web 243 outer margins, like ratchet bars 254 are disposed in spaced parallelism and suitable length with their toothed edges, divided in intervals of control unit ladder feed, opposed to the paths of detent 251 travel in a spacing productive of detent engagement with the ratchet bar teeth when said detents are projected through the head inner face. Thus, pressure-induced, downward shift of the arm 248 free end functions to project the detents 251 from the head 249 and into latching engagement with corresponding teeth of the ratchet bars 254 and to then depress the head and the member 241 like distances along their guides with consequent, like, switch-closing displacement of the selector fingers 233 on each bar 225 past which said member 241 is moved with certain of its triggers 240 set by means of the webs 243; release of the arm 248 shifting pressure permitting retraction of the detents 251 within the head 249 and return of said head and arm to their uppermost positions wherein they are available for repetitious actuation to further depress the member 241, with its triggers 240 reset if desired, from and beyond that relation with the control unit ladder to which it was previously moved and where it was left when the head and arm were permitted to return to their operative range upper limits. Selective, proportioned, pressure actuation of the arm 248 in the manner and for the purposes above described is had through a bank of levers 255 spaced apart transversely of and slidably engaged through the control unit face for independent, vertical reciprocation relative to the latter in shift-inducing, bearing engagement with said arm, the disposition and respective travel ranges of the individual levers 255 being so arranged and proportioned as to vary their capacity for arm 248 free end shift by one interval of control unit feed in a uniform progression from the innermost and to the outermost elements of the bank. Thus, actuation of the innermost lever 255 to the downward limit of its travel range operates to move the arm 248 free end, and the mechanism reactive thereto, one interval of ladder feed for setting of the selector fingers 233 on but one bar 225 of said ladder, thereby determining the composition of a single

sandwich to be produced by the apparatus; actuation of the next, outwardly-adjacent lever 255 moves the arm free end two intervals of ladder feed, or past two bars 225, thereby determining the composition of two identical sandwiches to be successively produced by the apparatus; and similarly to the outermost element of the bank, which, being tenth in succession in the illustrated embodiment, moves the arm free end ten intervals of ladder feed, or past ten bars 225, for setting of the controls effective to successively produce ten identical sandwiches. Since the functions of the trigger 240 settings had through the agency of the webs 243 are accomplished when the member 241 has been depressed the selected number of ladder feed intervals, it is appropriate to release the web 243 latches 244 for automatic reconditioning of said member and its triggers to receive subsequent option indications whenever any one of the levers 255 has been operated, hence means 238 reactive to full range operation of each and any lever 255 is provided in tripping relation with said web latches 244. Obviously, the construction and operative arrangement of the control unit shown and described permits of the charging thereto of the indications pertinent to the successive production of any desired number of like sandwiches within the capacity of the unit, prior to or during operation of the apparatus, and in addition permits the charging thereto of subsequent such indications, similar or alternative in character, within the remaining sandwich number capacity, while the apparatus is operating in automatic reaction to previously-imposed indications.

The circuit for the supply of electrical energy to the motor 65 may conveniently be branched to serve the other electrically-reactive elements of the apparatus, includes the switch 211 reactive to an uncharged condition of the plate elevator to interrupt the circuit and inhibit apparatus operation until the elevator has been recharged, and may advantageously include a manually-operable main switch 257 wherethrough supply of energy to the apparatus can be selectively controlled. As an additional convenience, the switch 211 may be linked with a switch 258 in a circuit serving a tell-tale light 259 on the control unit face in such manner as to energize said light when the switch 211 is open to break the supply circuit, and thereby give visual notice of the lack of plates on the elevator and the inoperative condition of the apparatus. There being in the control unit a number of elements whereof the relative position is indicative of conditioned, operative potential of the apparatus or, alternatively, completion of the operations wherewith the unit has been charged, it is feasible and expedient to provide a switch 260 in the supply circuit to the motor 65 automatically reactive to one or another of said elements, through any one of a number of conventional arrangements not specifically shown, to complete the circuit to said motor when the control unit has been charged and conditioned for apparatus operation, and to break said circuit to the motor when the operations charged into the control unit have been completed.

Operation of the elements and sub-assemblies comprised in the apparatus and its control unit having been hereinabove developed in connection with the structural description thereof, it would appear that the drawings and foregoing description are adequate to development of a full under-

standing of the invention and the operative principles and advantages inherent therein.

Since changes, variations, and modifications in the specific form, construction, and arrangement of the elements shown and described may be had without departing from the spirit of my invention, I wish to be understood as being limited solely by the scope of the appended claims, rather than by any details of the illustrative showing and foregoing description.

I claim as my invention:

1. A sandwich-making machine comprising a vertically-disposed, rotatable shaft, a circular assembly of like, uniformly and angularly spaced, receiving plates mounted for rotation on and concentrically about said shaft, powered gear means operable to regularly and intermittently rotate said shaft, other gear means operatively correlated with said first gear means to regularly and intermittently advance said assembly one interval of the assembly plate spacing in synchronous alternation with rotation of the shaft, orbitally-spaced stations registered with and marking the rest positions of the assembly plates, plate-charging instrumentalities individually associated with a succession of said stations, an actuating arm for each of said instrumentalities reciprocable radially of the plate assembly, multi-lobed cams fixed to said shaft in engagement with and for the simultaneous reciprocation of said actuating arms as an incident of shaft rotation, multi-unit, sandwich component supply means selectively unit-registerable with and for contents delivery through the plate-charging instrumentalities of certain of said stations, means for selectively inhibiting the operation of certain of said plate-charging instrumentalities, means for registering selected units of said component supply means with the associated stations and instrumentalities, indexing means receptive of manually-imposed option indications in synchronous, step-by-step driven relation with said plate assembly, and means automatically reactive to indexing means travel for reflecting the option indications imposed on the latter as corresponding instrumentality operation regulation and supply means unit registration.

2. The organization according to claim 1, wherein the orbit through which the assembly plates move is defined between spacedly-concentric, circular walls fixedly upstanding in clearing relation with and above the plate side margins in concentric relation with the shaft mounting the assembly, and each of said plates is furnished with a retainer fixedly upstanding from its trailing margin between said walls for cooperation with the latter in the retention of deposited material in positioned relation with and on the associated plate.

3. The organization according to claim 1, wherein the means for intermittently rotating the plate assembly in synchronous alternation with the shaft comprises a sleeve coaxial with and independently rotatable about said shaft in fixed supporting relation with said assembly, a second rotatable shaft spacedly paralleling said first shaft, a mutilated gear drive operatively between said first and second shafts, a second mutilated gear drive between said second shaft and sleeve, and an electric motor in constant-driving relation with said second shaft.

4. The organization according to claim 1, wherein the orbit through which the assembly plates move is defined between spacedly-concentric, circular walls fixedly upstanding in clearing

relation with and above the plate side margins and the orbitally-spaced stations marking the rest positions of the plates are manifest in and on said walls, successively in the direction of plate assembly rotation from an initial point, as a pair of coplanar, spacedly-opposed webs fixedly extending from opposed wall faces in closely-spaced, clearing relation above the plate position of rest to receive, support, and position a bread slice for transfer to the associated plate as the latter is caused to advance through its orbit, a lettuce receiver fixedly upstanding above said walls in superposed registration with the plate second position of rest and in operative association with a slicing blade reciprocable radially of said walls across the receiver bottom, a second slicing blade reciprocably supported radially and inwardly of the inner wall at the plate third position of rest for coaction with individually-registered receivers of a selectively-rotatable assembly thereof, a third slicing blade reciprocably supported radially and inwardly of the inner wall at the plate fourth position of rest for coaction with individually-registered receivers of a second selectively-rotatable assembly thereof, a second pair of coplanar, spacedly-opposed webs for the reception, support, and positioning of a bread slice fixedly extending from opposed wall faces at the plate fifth position of rest in elevated relation with the associated plate such as will clear the material previously deposited upon and carried by said plate, and opposed gates intersecting said walls at the plate sixth position of rest in registration radially of the plate orbit for the accommodation of a plate-clearing pusher reciprocable therethrough, the outer of said gates communicating with a slide trough projecting radially and outwardly from the plate orbit.

5. The organization according to claim 1, wherein the sandwich component supply means first in the cycle of plate assembly rotation comprises a multi-compartment unit for the accommodation of sliced charges of selected types and kinds of bread shiftably mounted for selective registration of its respective compartments with the station marking the plate first position of rest, means reactive to option indications imposed on the indexing means through the assembly-rotating means to effect desired registration of a unit compartment, and means reactive through the associated plate-charging instrumentality to deliver a bread slice from the so-registered compartment and to the associated station.

6. The organization according to claim 1, wherein the sandwich component supply means second in the cycle of plate assembly rotation comprises a lettuce receiver registered with, above, and for gravity-delivery to the associated station in cooperation with a slicing blade reciprocable across its bottom, manually-adjustable means on said receiver for selectively varying the thickness of slice severable by said blade, a normally-interrupted drive for said blade, means reactive to option indications imposed on the indexing means through the assembly-rotating means to complete the drive to said blade, and means reactive to initial blade travel to compact the receiver charge in and across the blade path.

7. The organization according to claim 1, wherein the sandwich component supply means third and fourth in the cycle of plate assembly rotation are independently-controlled, functional duplicates each comprising a rotatable assembly of like filling material receivers selective-

ly registrable with, above, and for gravity-delivery to the associated station in cooperation with a slicing blade reciprocable thereacross, manually-adjustable means on each said receiver for selectively varying the thickness of slice severable therefrom by said blade, a drive for said blade, means reactive to option indications imposed on the indexing means through the assembly-rotating means to rotate the receiver assembly for operative registration of a desired receiver with the associated station, and means reactive to initial travel of the associated blade to compact the charge in the station-registered receiver in and across the blade path.

8. The organization according to claim 1, wherein the sandwich component supply means fifth in the cycle of plate assembly rotation comprises a multi-compartment unit for the accommodation of sliced charges of selected types and kinds of bread shiftably mounted for selective registration of its respective compartments with the associated station, means reactive to option indications imposed on the indexing means through the assembly-rotating means to effect compartment and station registration corresponding with that developed at the first plate cycle station at the initiation of the given cycle, and means reactive through the associated plate-charging instrumentality to deliver a bread slice from the so-registered compartment and to the associated station.

9. The organization according to claim 1, wherein the station last in the cycle of plate assembly rotation includes means automatically and reciprocably reactive to plate-charging instrumentality operation through the station marking the last cyclic position of plate rest to shift the charge from the so-stationed plate to a support extraneous of the plate orbit, synchronously-correlated means reactive to said instrumentality operation under conditions determined by option indications imposed on the indexing means as made manifest by operation of the assembly-rotating means to compress, divide, and trim the charge on said support, and means cooperatively associated with said synchronously-correlated means for maintaining a serving plate in charge-receiving relation with said support, automatically transferring the charge from said support to the adjacent serving plate, and shifting the so-charged service plate to a position of ready availability away from the apparatus.

10. The organization according to claim 1, wherein the indexing means comprises an endless bank of selector fingers individually shiftable into and out of circuit-establishing relations movable past and in circuit-completing cooperation with a multi-interval contact panel, means correlated with the assembly-rotating means effective to intermittently advance said bank one interval across said panel in synchronism with each interval advance of said assembly, unit-positioning and instrumentality-conditioning elements served by the circuits controlled by said fingers and panel, means manually and selectively actuatable to trigger said fingers for shift into circuit-establishing positions in advance of finger travel past said panel, separate means manually and selectively actuatable to correspondingly shift a desired longitudinal sequence of said fingers in accordance with their triggered potential, means for automatically releasing the triggered, finger-shifting, potential at the conclusion of each longitudinal sequence shift, and means for returning

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the shifted fingers out of circuit-establishing relations subsequent to their travel past said panel.

11. In a sandwich-making machine, an operating station, a multi-trough bread receiver reciprocably shiftable into and out of corresponding end registration of its respective troughs with said station, selectively-controllable means operable to effect desired receiver trough and station registration, means engageable as an incident of given trough and station registration for advancing the trough charge a one-slice interval toward the station, a slice-placer hingedly cooperating with the station-registrable end of each receiver trough, a reciprocable actuating member shiftable in one direction to first operate the means for advancing the trough charge and subsequently operate the slice-placer, and means for shifting said member.

12. The organization according to claim 11, wherein the delivery ends of the bread receiver troughs are furnished with like slice-placers, each of which comprises a generally-rectangular, rigid, open frame defining a slice-accommodating opening hinged at its lower end member to the bottom of the associated trough end for actuation through a vertical arc between upstanding, opening-registered cooperation with said trough end and substantially coplanar, longitudinal extension beyond the associated trough bottom, a trigger plate mounted for independent articulation on the frame hinge axis in adjacent, underlying relation with the frame lower end member, resilient means engaging said plate to yieldably urge the latter and the associated frame to upper limits of their range of oscillation, a yoke slidable longitudinally of said frame in bridging relation across the frame opening remote from said plate, connections operatively between ends of said yoke and corresponding ends of the trigger plate, whereby oscillation of the latter relative to and away from the associated frame acts to shift said yoke longitudinally of and for constriction of the opening through the frame, resilient means yieldably urging said yoke to a position of maximum frame opening and said plate to close adjacency with the frame lower end member, an arm fixedly depending from said trigger plate for operative engagement, at times, with said actuating member, a frame closure hinged to the trough end above said frame to swing in a vertical arc into and out of covering relation with the frame face and opening remote from the trough, and means effective as an incident of frame oscillation to swing said closure outwardly and away from the frame as the latter is moved out of registration with the trough end and to return said closure into covering relation with the frame opening as the frame returns to registration with its trough end.

13. In a sandwich-making machine, an operating station, an open-end housing for the accommodation of filling material spacedly registered with, above, and to open downwardly toward said station, a removable and replaceable closure for the upper end of said housing, an open sleeve about and adjustable altitudinally of the housing lower end, manually-actuatable connections between said sleeve and housing operable to adjust the altitudinal relation therebetween, a closure plate slidably carried by and shiftable into and out of closing relation across the lower end of said sleeve, a slicing blade reciprocable through and across said housing in spaced parallelism with and above said closure plate, means

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for reciprocating said blade, means operable as an incident of blade reciprocation to shift said closure plate relative to said sleeve in maintained correlation with the blade cutting edge, a charge-compressor operatively associated with said housing, means reactive to blade reciprocation effective to feed and maintain said compressor in compacting relation with the housing charge, and means reactive to sleeve and housing relative adjustment for automatically proportioning the compressor feed to the thickness of slice cut effected by said blade.

14. The organization according to claim 13, wherein the housing and blade are operatively interrelated in fixed relation with the associated station, and the means for reciprocating the blade includes an interrupted, normally-inoperative member selectively latchable for operative blade drive.

15. The organization according to claim 13, wherein the blade is operatively associated with the station, and a plurality of like housing assemblies is movably associated with the station for selective, individual, cooperating registration with said station and blade.

16. In a sandwich-making machine, an operating station, a fixed support substantially coplanar with and adjacent said station, compressing, trimming, and dividing means reciprocably cooperating with said support for the conditioning of a charge thereon, pusher means reciprocable to shift a charge from the station and to said support, a serving plate carrier altitudinally shiftable adjacent said support, means for shifting the conditioned charge from said support and to an exposed, carrier-supported serving plate, subsequently-operable means for shifting the charged serving plate from said carrier and to a ready shelf, and a drive for synchronously and progressively operating said pusher, compressing, trimming and dividing means, conditioned-charge-shifting means, serving-plate-shifting means, and carrier.

17. The organization according to claim 16, wherein the drive to the compressing, trimming and dividing means, conditioned-charge-shifting means, serving-plate-shifting means, and carrier is normally interrupted and automatically operatively completed through agencies indicative of a charge present at the associated station, and the trimming-means-operating drive is susceptible of selective interruption through the agency of optional controls.

18. In a sandwich-making machine, indexing means receptive of and to operatively reflect manually imposed option indications, comprising a contact panel, a plurality of electric circuits individually connected in open circuit relation with the panel contacts, a bank of selector fingers movable past said panel in potential completing relation with the circuits thereof, a step-by-step drive for said bank, a normally-open switch associated with each said selector finger, manually-reactive means for selectively triggering said fingers to closing relation with the associated switch in advance of finger travel across said panel, and other manually-reactive means for transferring a given finger-triggered condition to a succession of selector fingers aligned in the direction of bank travel.

19. The organization according to claim 18, wherein said selector fingers are grouped in rows perpendicular to the direction of bank travel and in rows aligned in the direction of bank travel for successive like traverse of the contact panel,

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the contacts of said panel are grouped in corresponding rows spaced apart in the direction of bank travel uniform distances corresponding to the intervals of bank step-by-step travel, and the switch-closing triggering of the selector 5 fingers is accomplished through the agency of a member shiftable longitudinally of said bank across a succession of transverse selector finger rows in a triggering reaction on the fingers of each transverse row corresponding with option 10 indications manually imposed thereon.

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