

No. 647,670.

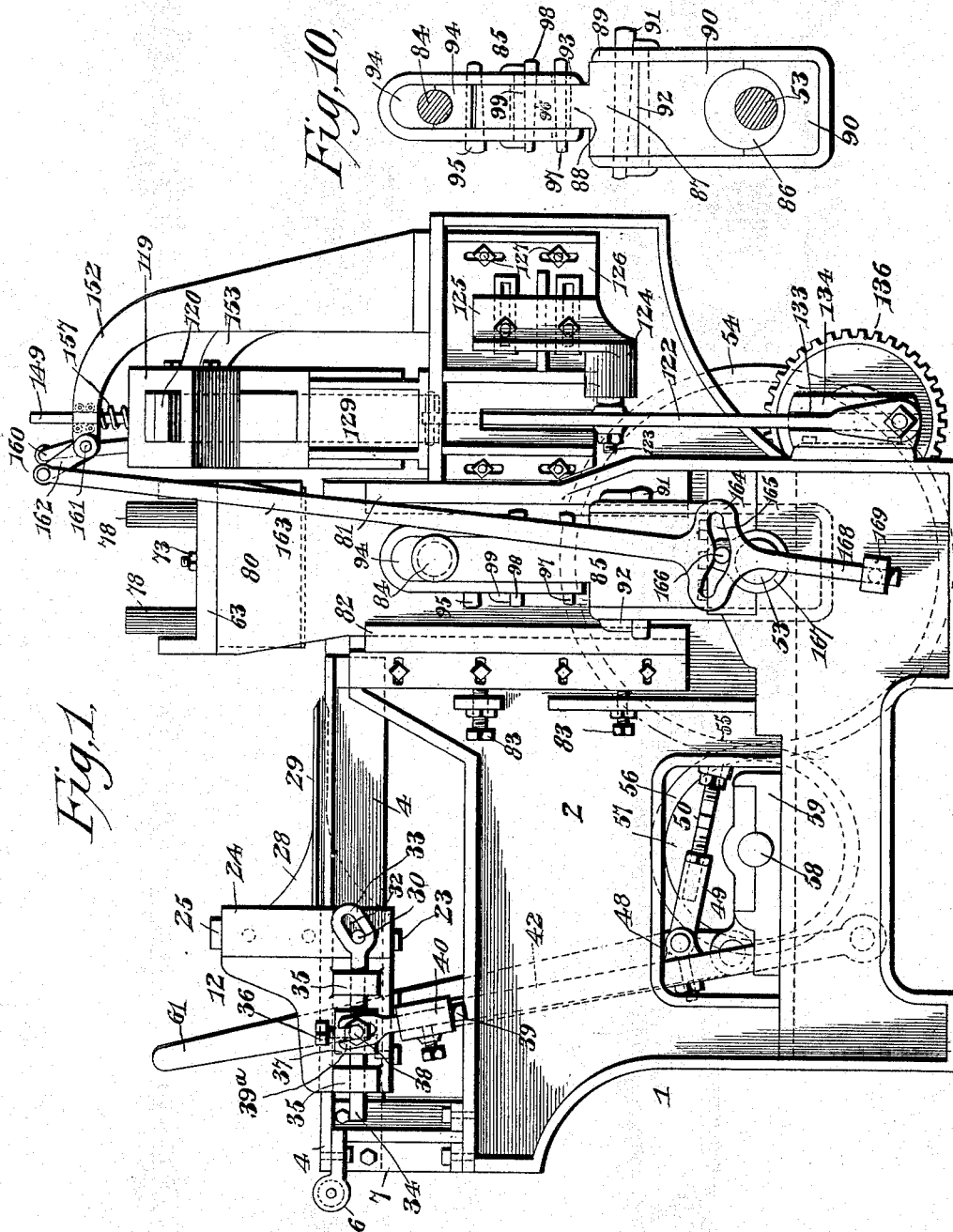
Patented Apr. 17, 1900.

T. CREBBIN.  
DISH MAKING MACHINE.

(Application filed Mar. 8, 1899.)

(No Model.)

5 Sheets—Sheet 1.



Witnesses

Jas. H. McArthur  
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No. 647,670.

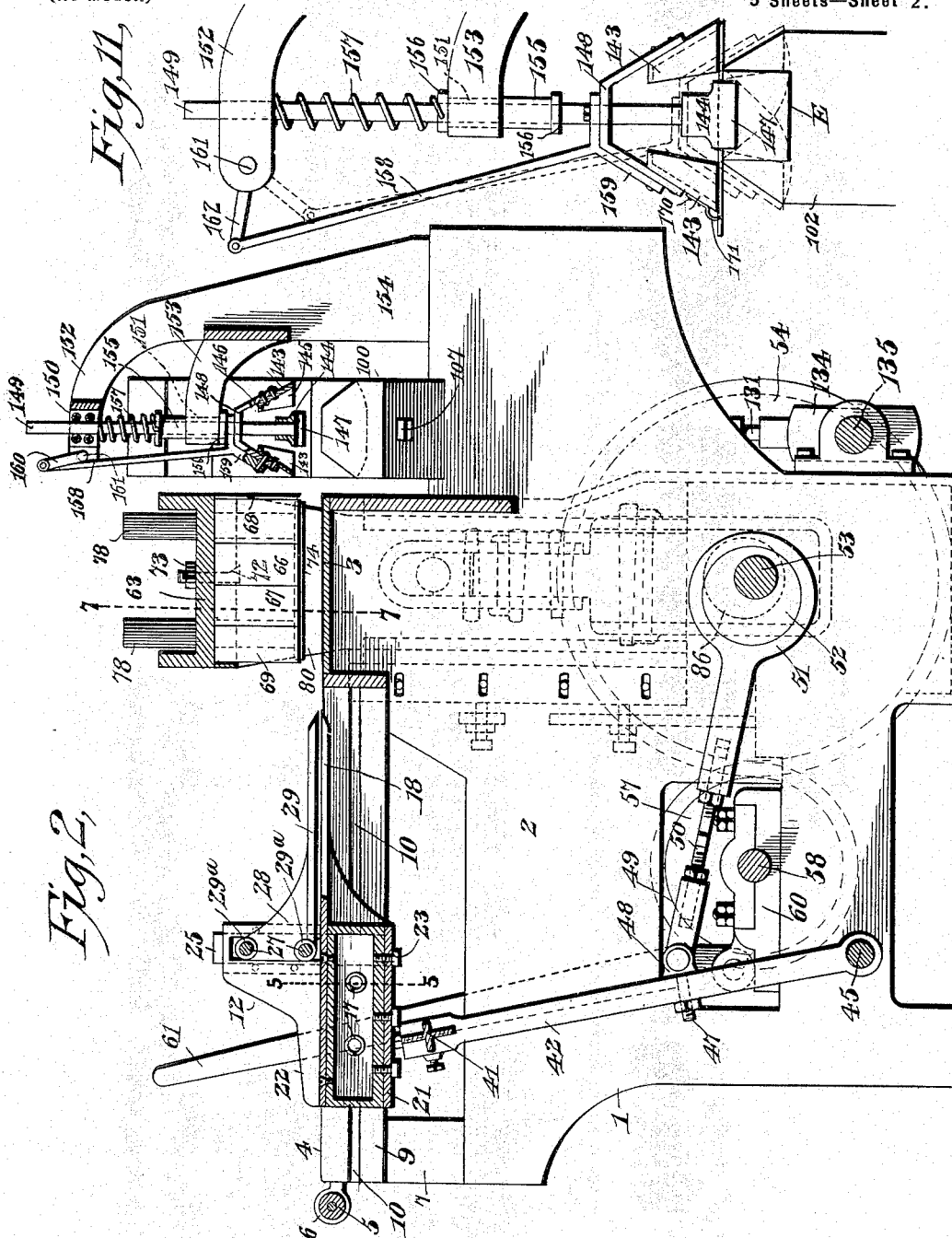
Patented Apr. 17, 1900.

T. CREBBIN.  
DISH MAKING MACHINE.

(Application filed Mar. 3, 1899.)

(No Model.)

5 Sheets—Sheet 2.



Witnesses

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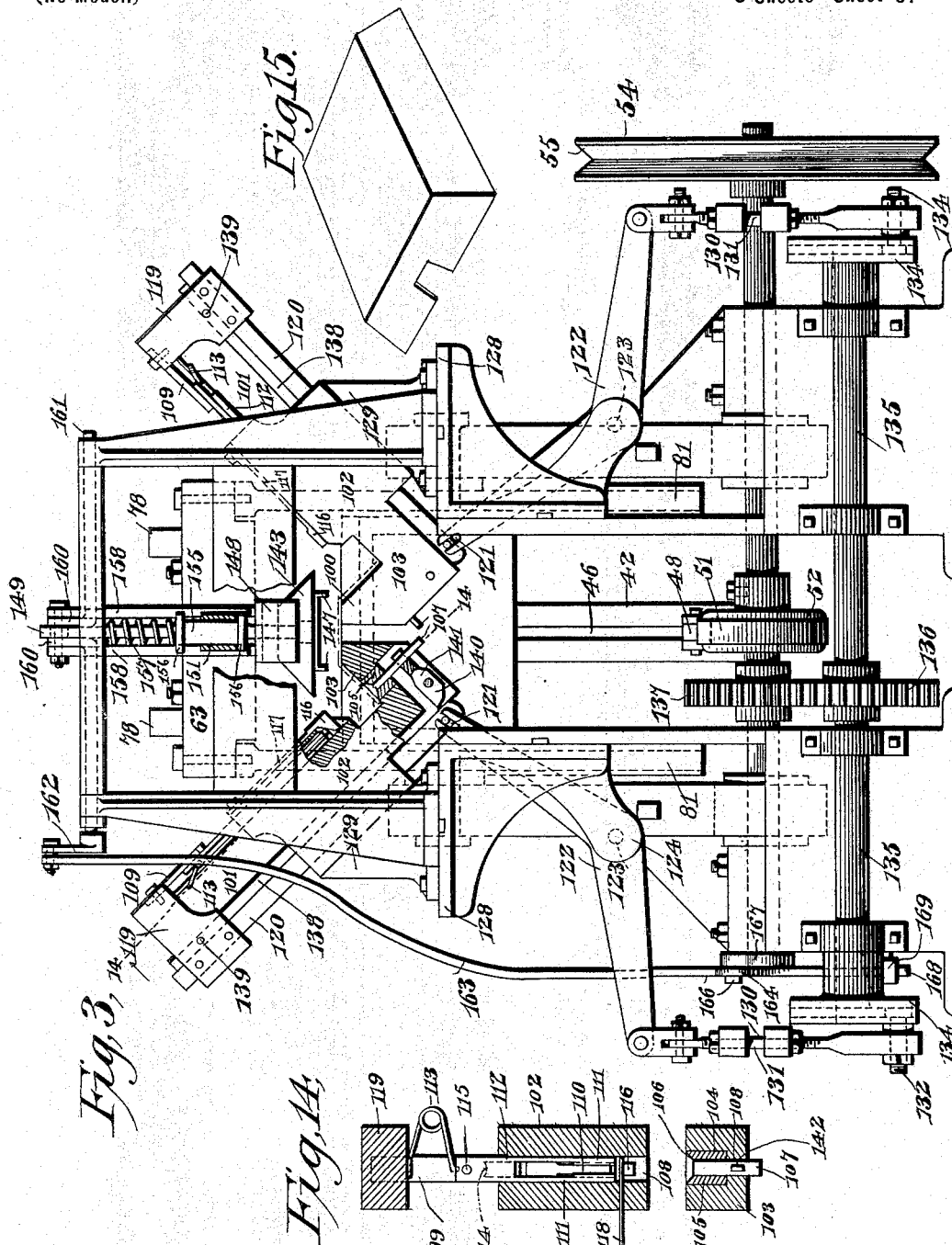
Patented Apr. 17, 1900.

T. CREBBIN.  
DISH MAKING MACHINE.

(Application filed Mar. 3, 1899.)

(No Model.)

5 Sheets—Sheet 3.



Witnesses

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No. 647,670.

Patented Apr. 17, 1900.

**T. CREBBIN.**  
**DISH MAKING MACHINE.**  
 (Application filed Mar. 3, 1899.)

(No Model.)

5 Sheets—Sheet 4.

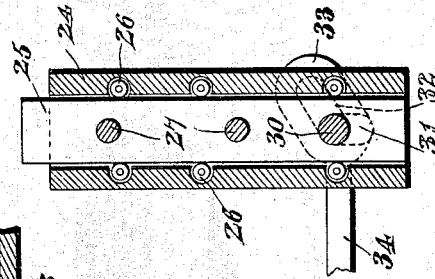
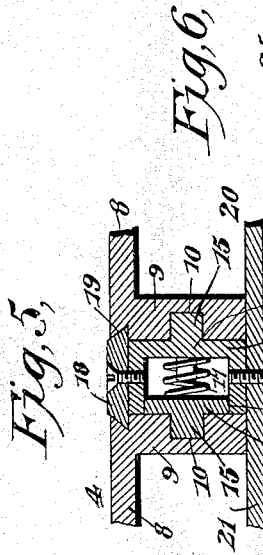
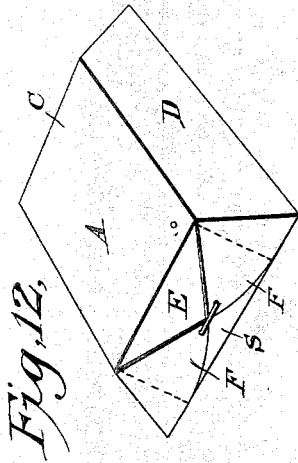
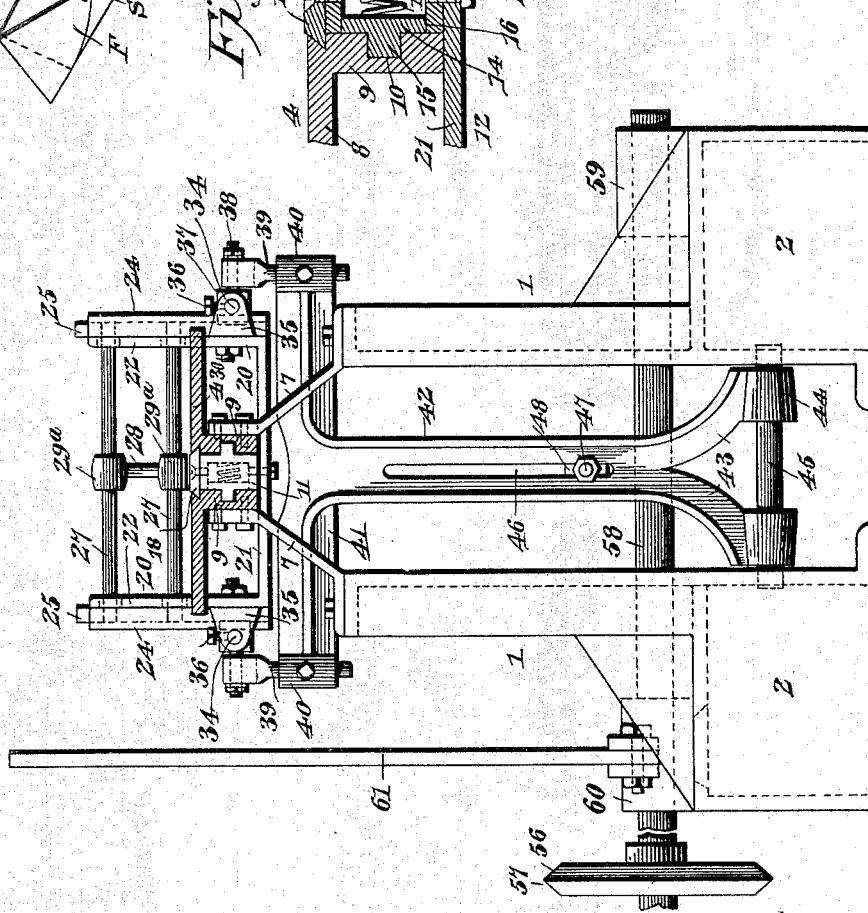


Fig. 4,



Witnesses

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No. 647,670.

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T. CREBBIN.  
DISH MAKING MACHINE.  
(Application filed Mar. 3, 1899.)

(No Model.)

5 Sheets—Sheet 5.

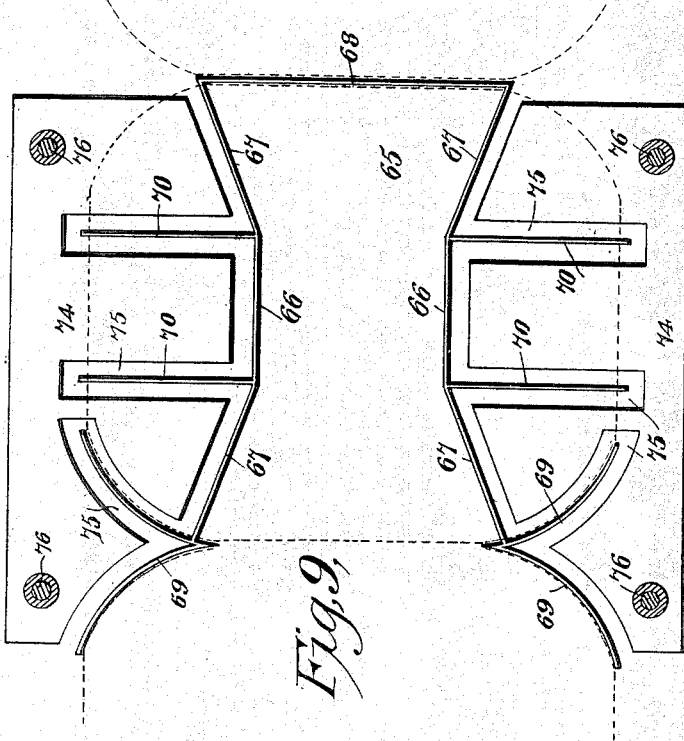


Fig. 9.

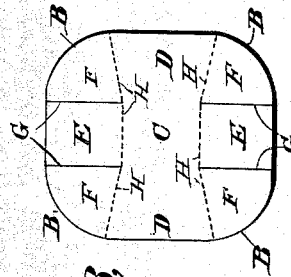


Fig. 13.

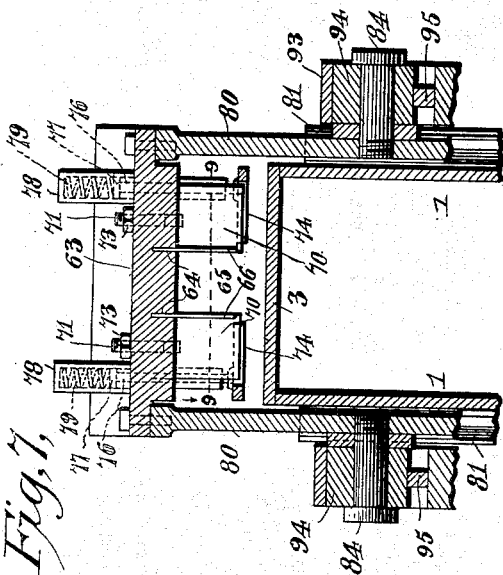


Fig. 1.

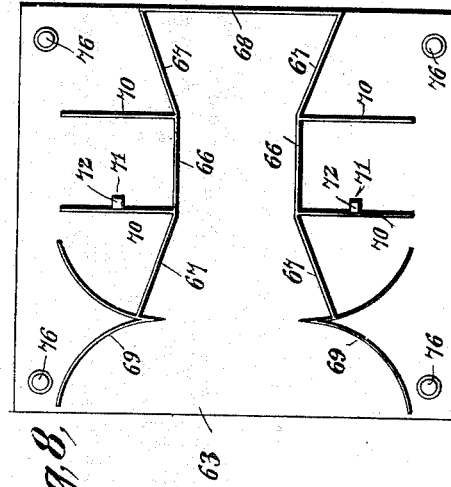


Fig. 8.

Witnesses

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# UNITED STATES PATENT OFFICE.

THOMAS CREBBIN, OF BRIDGEPORT, ALABAMA, ASSIGNOR TO THE BRIDGEPORT WOODEN WARE MANUFACTURING COMPANY, OF SAME PLACE.

## DISH-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 647,670, dated April 17, 1900.

Application filed March 3, 1899. Serial No. 707,636. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS CREBBIN, a citizen of the United States, residing at Bridgeport, in the county of Jackson and State of Alabama, have invented a new and useful Dish-Making Machine, of which the following is a specification.

This invention relates to machines for making receptacles from veneer or paper; and it has for its object to provide an improved machine of this character especially designed for making from a sheet of veneer or paper the shallow trays or receptacles commonly known as "butter-dishes," which are used as receptacles for butter, lard, pickles, &c.

To this end the invention primarily contemplates a veneer-dish-making machine having novel feeding, blanking or cutting, forming, and stapling mechanism so constructed, relatively arranged, and timed in their respective movements as to provide for continuously and automatically feeding a veneer sheet into position for being successively cut and scored into a dish-blank, folded into the form of a complete dish, and then having the lapping parts stapled together to complete the article, which is then ejected from the machine.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

While the essential and characteristic features of the invention are necessarily susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a dish-making machine constructed in accordance with the present invention. Fig. 2 is a vertical longitudinal sectional view thereof. Fig. 3 is an end view of the machine, partly in section, showing the relative positions of the folder and the oppositely-located obliquely-arranged stapling devices. Fig. 4 is an end view of the machine. Fig. 5 is an enlarged detail sectional view on the line 5 5 of Fig. 2, showing more clearly the construction of the hollow side block of the feed-carriage and its

relation to the feed-table and the lower clamp-finger sliding therein. Fig. 6 is an enlarged detail sectional view showing the mounting of one of the clamp-slides of the feed-carriage and the adjusting connection of the adjusting-rod therewith. Fig. 7 is a detail sectional view through the vertically-reciprocating knife-head on the line 7 7 of Fig. 2. Fig. 8 is a bottom plan view of the knife-head, showing the combination cutting and scoring knife fitted therein. Fig. 9 is a detail view on the line 9 9 of Fig. 7, showing the relation of the presser-plates for the veneer sheet to the knife members of the combination-knife. Fig. 10 is an enlarged elevation of one of the sectional adjustable pitmen for the vertically-reciprocating frame carrying the head for the knives. Fig. 11 is an enlarged detail view of the folder and form-block, showing two positions of the folder. Fig. 12 is a detail in perspective of the completed article or butter-dish manufactured by the machine. Fig. 13 is a plan view of the dish-blank after having been scored and cut by the combination-knife and prior to being operated upon by the folder. Fig. 14 is a detail sectional view of the staple forming, driving, and clenching mechanism of one of the stapling devices, the section being taken on the line 14 14 of Fig. 3. Fig. 15 is a detail view of a shell form.

Like letters and numerals of reference designate corresponding parts in the several views of the drawings.

The article manufactured by the machine is a shallow tray or receptacle commonly known as a "butter-dish" and is of the form illustrated in Fig. 12 of the drawings. This butter-dish (designated by the letter A) is formed from a single blank of veneer which is cut from a continuous sheet or strip of veneer fed through the machine in the manner hereinafter explained. The dish-blank is cut into an approximately-rectangular shape, as shown in Fig. 13 of the drawings, and has the surplus corners thereof rounded off, as indicated by the letter B, and the uncut body portion of the blank forms the usual bottom C and side portions D, the bottom C lying between the oppositely-located side portions D, which are bent up from the bottom to give the tray or dish the usual shallow flaring

form, and in cutting out the blank from a veneer sheet or strip the machine forms the blank with the central end flaps E and the terminal side flaps F, which are completely severed from the end flaps E by the slits or cuts G and are adapted to be overlapped upon the outside of the tongues E and secured together and to the tongues by the fastening-staples S, passing through the lapping parts.

10 The machine in forming the blank not only completely separates the tongues and flaps E and F, but at the juncture of the tongues and flaps with the uncut portion of the blank scores the blank along the scoring-lines H, the score-lines for the flaps F adjoining, but

15 disposed at an obtuse angle to the score-lines for the tongues E, whereby the tongues and flaps will readily fold upon each other to the positions shown in Fig. 12 of the drawings.

20 Each blank is alike and is automatically cut from the continuous sheet or strip of veneer which is fed into position by the feeding mechanism of the machine.

The machine embodies four separate and distinct mechanisms—namely, the feeding mechanism, the blanking and cutting mechanism, the folding mechanism, and the stapling mechanism—which successively provide for feeding the sheet or strip of veneer, cutting out the dish-blank, folding the cut blank, and, finally, stapling the lapping parts of the blank to form the completed article, (shown in Fig. 12 of the drawings,) and I shall now proceed to describe the complete machine with reference to these different mechanisms embodied therein.

The main frame or stand of the machine is designated by the numeral 1 and essentially consists of the opposite skeleton frame sides 2, rigidly braced apart and constituting supports for all of the working parts of the machine, and said stand or frame 1 has fitted to the top thereof a flat horizontal knife-platen 3, onto which the continuous sheet or strip of veneer is fed to have the dish-blank cut therefrom, and this feeding of the veneer onto the knife-platen is accomplished through the medium of the feeding mechanism, which will now be described.

50 In connection with the flat horizontal knife-platen 3 at the top of the machine frame or stand there is employed a flat horizontal feed-table 4, having the upper surface thereof flush with the corresponding surface of the platen 3 and practically forming a continuation thereof. The feed-table 4 directly adjoins the knife-platen 3 and extends therefrom out to one end of the machine frame or stand, at which point is located a horizontal guide-roller 5, supported between suitable bearing-brackets 6, projected from one end of the machine frame or stand, said guide-roller 5 facilitating the passage of the veneer sheet or strip onto the table, it being understood

65 that the veneer is delivered to the feed-table of the machine from a roll or in any other convenient manner. The feed-table 4 is ma-

terially longer than the platen 3, which it adjoins, and is sustained in an elevated position above the adjacent top edges of the frame sides by means of suitable supporting legs or brackets 7, bolted thereto and also to the sides of the frame or stand, and said feed-table is preferably formed of separate duplicate plate members 8, arranged in the same horizontal plane and provided at their inner contiguous longitudinal edges with depending guide-flanges 9, having formed in their inner opposing faces longitudinal guide-grooves 10 and spaced a distance apart to form a slide-way for the hollow slide block or box 11 of the horizontally-reciprocating feed-carriage 12.

The hollow slide block or box 11, which works within the slideway between the flanges 9, is preferably of a rectangular construction and is provided with opposite relatively fixed and movable side walls 13 and 14, respectively, which side walls are provided upon their outer sides with the longitudinal ribs 15, slidably registering in the guide-grooves 10 of the table-flanges 9. The movable side wall 14 of the hollow slide-block 11 loosely registers in the open side 16 of the block 11 and is held in frictional engagement with the adjacent table-flange 9 by means of pressure-springs 17, housed within the block 11 and interposed between the fixed and movable walls 13 and 14 thereof, whereby the same will normally exert an outward pressure against the movable wall 14, so that the same will have a firm frictional engagement with the adjacent table-flange 9, and thereby serve to resist any forward movement of the sliding feed-carriage until the sheet of veneer has been tightly gripped between the clamping devices thereof in the manner to be presently explained.

The hollow slide block or box 11 of the feed-carriage 12 has bolted or otherwise rigidly fastened to the top side thereof a narrow elongated lower clamp-finger 18, slidably registering in the dovetailed slide-groove 19, formed centrally and longitudinally of the feed-table in the upper side thereof at the contiguous longitudinal edges of the separate plate members 8, and it will be observed that the clamp-finger 18 projects slightly above the plane of the upper surface of the feed-table, so that the sheet of veneer can be firmly clamped thereon. The said lower clamp-finger and the slide-block carrying the same constitute a part of the feed-carriage 12, all of the working parts of which are supported and carried by the substantially U-shaped yoke-frame 20, having a lower transverse horizontal portion 21, and the upright frame sides 22, arising from the ends of the horizontal portion 20, and said horizontal portion 20 of the yoke-frame has rigidly fastened thereto by means of the bolt-screws or equivalent fastenings 23 the said slide block or box 11. The upright frame sides 22 of the yoke-frame are formed with vertically-disposed guide-boxings 24, in which are slid-

ably mounted the vertically-movable clamp-slides 25, having a bearing against the anti-friction-rolls 26, arranged at the side edges of said slides within the boxing 24. The oppositely-located vertically-movable clamp-slides 25 are connected by transversely-arranged tie-rods 27, which support centrally between the opposite frame sides 22 of the yoke-frame the clamp-head 28 of the upper clamp-finger 29, lying directly above and parallel and coextensive with the lower clamp-finger 18, carried by the slide-block of the feed-carriage. The said clamp-head 28 essentially consists of a web having upper and lower collar portions 29<sup>a</sup>, respectively embracing the separate tie-rods 27, which connect the clamp-slides 25, and the upper clamp-finger 29 is projected from the head 28 at one side of the tie-rod and extends beyond the feed-carriage in a direction toward the knife-platen 3, and as the clamp-fingers 29 and 18 are arranged one above the other and designed to receive therebetween the sheet or strip of veneer it will be observed that when the veneer is gripped between the said fingers the same can be carried by the movement of the carriage to a proper position on the knife-platen 3 to receive the cut and impression of the cutting and scoring knives of the combination-knife, that will be hereinafter fully described.

The vertically-movable clamp-slides 25 have projected from their outer sides the rigid studs 30, working in the vertically-disposed slots 31 of the guide-boxings 24 and engaging in the inclined slots 32 of the slotted cam-heads 33, projected obliquely from one end of the longitudinally-movable horizontal adjusting-rods 34, slidably mounted in the perforated supporting ears or lugs 35, projected outwardly from the opposite frame sides 22 of the yoke-frame. Between the ears or lugs 35, supporting the adjusting-rods 34 at the sides of the frame, said adjusting-rods have adjustably clamped thereon by means of the clamping-screws 36 the knuckle-blocks 37, provided with offstanding stud-bolts 38, loosely receiving the forks 39<sup>a</sup>, formed at the upper ends of the links 39, adjustably fitted in the collars 40 at the opposite extremities of the horizontal cross-head 41, formed at the upper end of the upright swinging standard 42.

The upright swinging standard 42 is arranged between the frame sides 2, near one end of the frame, and is provided with a lower forked end 43, having the collars 44, receiving the transverse pivot-rods 45, having its extremities fitted in the sides of the machine frame or stand to provide a fulcrum or pivotal support of the swinging standard, and between its ends this swinging standard is provided with a longitudinally-disposed slot 46, in which is adjustably fitted the bolt 47 of the coupling-block 48, to which is connected one end of the eccentric-rod 49. The said eccentric-rod is provided between its ends with a turnbuckle 50, whereby the rod may be

lengthened or shortened to vary the length of the throw of the standard 42, and said turnbuckle, in connection with the adjustability of the coupling-block 48, provides for varying the throw of the standard 42, so as to adjust the movement of the feed-carriage to the size of dish-blank being cut and folded in the machine. At its end opposite the connection with the swinging standard 42 the eccentric-rod 49 is provided with an eccentric-strap 51, fitting the eccentric 52, mounted on the main operating-shaft 53. The main operating-shaft 53 is journaled transversely of the machine frame or stand and carries upon one end thereof an iron friction-wheel 54, having a peripheral groove 55, receiving the angular periphery 56 of the paper or equivalent friction-disk 57, mounted on one end of the transverse drive-shaft 58. The drive-shaft 58 is supported or journaled in the oppositely-arranged bearing-boxes 59 and 60, the bearing-box 60 being slidably mounted on the machine frame or stand and having connected therewith an adjusting-lever 61, which is grasped by the operator to provide for throwing the friction-disk 57 in and out of gear with the friction-wheel 54, thereby stopping and starting the machine at will. When the disk 57 is in frictional engagement with the wheel 54, motion is imparted to the main operating-shaft 53, which in turn, through the medium of the eccentric-rod 49, communicates motion to the upright swinging standard 42. As this standard moves in a forward direction toward the knife-platen 3 the adjusting-rods 34 will also be moved in a direction toward the said platen, and by reason of the upward inclination of the slotted cam-heads 33 of these adjusting-rods the rigid studs 30 of the slides 25 will be forced into the lower ends of the inclined slots 32, and will consequently draw the upper clamp-finger 29 down onto the sheet of veneer, thereby gripping the sheet of veneer between the two clamp-fingers before motion is imparted to the sliding feed-carriage. When the veneer is thus gripped, the continued forward movement of the swinging standard 42 will carry the sheet of veneer forward onto the knife-platen a distance equal to the proper width of the dish-blank to be cut from the sheet, at the same time displacing the cut and scored blank which is passed to the form for being folded and stapled.

Arranged to work above the knife-platen 3, onto which the material is fed through the mechanism described, is a vertically movable or reciprocating knife-head 63. This knife-head is removable and replaceable, so that different sizes of knives may be used, according to the size of dish being blanked out, and in the present invention the said knife-head has formed in the under side thereof a plurality of intersecting knife-receiving grooves 64, which receive the different members of the combination cutting and scoring knife 65. (Illustrated in Figs. 8 and 9 of the



drawings.) The configuration of the combination-knife 65 is the same as the configuration of the cut and scored portions of the dish-blank illustrated in Fig. 13 of the drawings, and essentially consists of the oppositely-arranged duplicate scoring members 66, extending across the knife-head nearly the entire length thereof and having inclined terminal portions 67, conforming to the angular disposition of the score-lines for the terminal side flaps F of the dish-blank. The opposite duplicate scoring members 66 of the combination-knife are connected at one end by the transverse cut-off-knife member 68, and have joined to their opposite ends the V-shaped slitting-knives 69, which provide for shaping the corners of the dish-blank, it being observed that the length of the cut-off-knife member 68 is the same as the distance between the apices of the oppositely-located V-shaped knife members 69 as each blank is severed from the sheet of veneer by the cut-off-knife member 68 severing the neck between the V-cuts formed by the said slitting-knife members 69, as indicated by dotted lines in Fig. 9 of the drawings. Intermediate the terminal knife members 68 and 69 the scoring members 66 have projected outwardly from their angles straight transversely-arranged slitting-knife members 70. A pair of the knife members 70 is projected from one side of each scoring member 66 and provide for cutting or slitting out from the blank the central end flaps E thereof, it being observed that the knife members 70 make the slits or cuts G in the blank.

The several knife members comprising the combination-knife described may be joined together in any suitable manner; but it is to be observed that the cutting edges of the several cutting or slitting members 68, 69, and 70 project below the corresponding edges of the scoring members 66, as the cutting or slitting members of the knife pass entirely through the veneer sheet, while the scoring members 66 only partially penetrate or make an impression on the blank to produce the scoring-lines H for the end tongues E and the flaps F. The combination-knife 65 is preferably held in the knife-receiving grooves 64 by means of the clamping-bolts 71. These clamping-bolts are provided with wedge-heads 72 at the lower ends, which are tightly wedged or drawn against suitable portions of the combination-knife when tightened up by the nuts 73, working on top of the knife-head. The bolt-openings which receive the clamping-bolts 71 are flared at their lower ends to correspond to the shape of the wedge-heads 72, and by reason of wedging the knife in the knife-head in the manner described it will be observed that the said knife can be easily adjusted in position or removed from the head when desired.

Coöperating with the knife-head and the knife thereof is a pair of presser-plates 74, arranged, respectively, at one side of the opposite scoring-knife members 66, so that there

is an open space between these knife members from end to end. The presser-plates 74 are arranged horizontally at the outer sides of the scoring-knife member 66, and each of said plates is provided in its edge next to the adjacent scoring-knife member with a plurality of notches 75, which receive the slitting-knives projecting outwardly from the scoring members, thereby permitting the presser-plates to freely move independently of the combination-knife. Each of the presser-plates 74 is supported on the lower ends of a pair of vertically-movable press-rods 76, sliding through openings formed in the knife-head 63 and provided at their upper ends with heads 77, working in the spring casings or barrels 78, supported on top of the knife-head and housing therein the pressure-spring 79, bearing on the heads 77 and normally pressing the rods 76 down, so as to project the plate supported by the rods below the plane of the cutting edges of the combination-knife. Hence when the knife-head descends the opposite presser-plates 74 will engage with the veneer sheet on the knife-platen 3 and hold the same perfectly smooth, while the continued downward movement of the knife-head carries the knife members into the veneer to cut out the blank in the manner already explained, and in this operation of the machine it will also be observed that the presser-plates 74 serve to prevent slipping of the veneer sheet when the feed-carriage recedes to a position for taking a new grip on the veneer, it being noted that the parts are so timed that the knife-head descends and blanks out the dish-blank while the feed-carriage releases its hold on the veneer and recedes to its initial position. With reference to the backward movement of the feed-carriage at the time the knife is in operation it will be observed that an outward movement of the adjusting-rods 34 forces the clamp-slides 25 upward, and thereby releases the upper clamp-finger from the veneer.

Returning to the knife-head, it will be observed that said knife-head is detachably bolted to the upper ends of the oppositely-located sliding knife-standards 80, which standards, in connection with the knife-head 63, constitute a vertically-reciprocating knife-frame. The sliding knife-standards are arranged, respectively, upon opposite sides of the machine frame or stand and have their side edges working in the vertical parallel guides 81 and 82, provided upon the outer side of each frame side 2, the guides 81 being fixed and the guides 82 being movable and held adjusted against the standards 80 by means of the adjusting-screws 83, mounted in a fixed support on the frame or stand. The movable guides 82 and the adjusting-screws therefor provide means for taking up wear, and thereby insuring a steady and positive reciprocation of the knife-standards. The said knife-standards have projected from their outer sides at a point intermediate their

upper and lower ends the offstanding connecting pins or studs 84, which are pivotally engaged by the upper ends of the sectional pitmen 85, the lower ends of which pitmen are fitted on the eccentrics 86, mounted fast on the main operating-shaft 53 and rotating therewith, it being observed that as the eccentrics 86 rotate the pitmen 85 will provide for the necessary reciprocation of the knife-carrying frame simultaneously with the operation of the sliding feed-carriage, which is also operated from the said shaft 53.

Each of the pitmen 85 essentially consists of a head 87, having a narrow arm extension 88, the head 87 having fitted thereto a yoke 89, carrying superposed bearing-brasses 90 for the eccentric 86, which are properly adjusted or tightened by means of a wedge-key 91, passing through the head 87 and opposite openings in the yoke 89 and bearing against a gib 92, also fitted in the head, and said openings in the yoke. The arm extension 88 is embraced by a slide-yoke 93, carrying within its closed end a sectional or two-part bearing-box 94 for the connecting pin or stud 84 of the sliding knife-standard, and the separate members of said bearing-box 94 are properly adjusted or tightened by means of the wedge-key 95, bearing against one of the members of the box 94 and passing through opposite openings in the yoke 93. The said arm extension 88 of each of the pitmen 85 is also provided with a plurality of separate key-openings 96, communicating with openings in the sides of the yoke 93 and respectively receiving therein the length-adjusting keys 97 and 98, one of which keys also fits directly against a shouldered gib 99, corresponding to the gib 92, employed in connection with the bearing for the eccentric 86. The adjusting-keys 97 and 98 provide means for changing the depth of scoring of the veneer, as it will be observed that by loosening the wedge-key 98 and driving the key 97 farther through the openings provided therefor the length of the pitmen will be shortened, thereby enable the veneer to be scored deeper, while, on the other hand, to avoid scoring the veneer too deep the wedge-key 97 is loosened and the wedge-key 98 driven farther through the openings provided therefor, which will lengthen up the pitmen, as will be readily observed by reference to detail Fig. 10 of the drawings.

The cut and scored dish-blank is displaced by the advancing sheet of veneer from the knife-platen 3 onto the form-block 100, which is arranged contiguous to and beyond one side of the knife-platen 3, with the upper surface thereof flush with the upper surface of the platen, so that the dish-blank will properly pass to a position on top of the form-block 100, ready to be folded into the completed shape of the dish or tray. The form-block 100 is of an oblong frusto-conical form to correspond to the interior configuration of the butter dish or tray, and said form-block is arranged with its small end uppermost, so

that the tongues and flaps, as well as the side portions of the dish-blank, may be folded therearound by the descending folder, which operates in conjunction with the form-block and which will be presently described. In the present invention the frusto-conical form-block 100 is arranged centrally between a pair of oppositely-located obliquely-arranged stapling devices 101 and at the lower contiguous ends of these stapling devices, so as to hold the folded blank in proper position for having the staples clenched through the lapping parts at both ends of the dish or tray. The said obliquely-disposed stapling devices 101 are disposed at right angles to the inclined surface of the form-block 100, and said form-block is preferably made in two parts or halves, each of which is formed integrally with the lower end of the casing-body 102 of each stapling device. Each member or half of the form-block 100 is designated by the number 103 and is provided therein with an opening 104, in which is rigidly fitted a hollow die 105, provided with a flaring outer end 106, which converges inwardly and is designed to deflect toward the center of the die, the points of the staple, which are clenched at the inner side of the tray or dish by means of the reciprocatory clenching-plunger 107, sliding through the die 105 in the form-block member and operated through the medium of the connections, as will be presently explained.

Each form-block member or half 103 at the lower end of the casing-body 102 of each stapling device has the inclined face thereof, which exposes the clenching devices, spaced from the lower end of the guide-opening 108, formed longitudinally through the casing-body for the reception of the staple forming and driving devices, and while these staple forming and driving devices may be of any approved construction still the same are preferably constructed and operated the same as the staple forming and driving devices disclosed in my former patent, No. 604,457. So I make no claim in this application to the specific construction of the means for forming and driving the staple, as the essential feature of the present invention is the relation of the stapling devices to the separate members of the form-block and the manner of operating the stapling mechanism.

Referring particularly to the staple forming and driving mechanism working in the guide-opening 108 of the casing-body 102, the hammer proper or staple-driver is designated by the number 109. This hammer or staple-driver is provided with a hammer-post 110, slidably fitting in the staple-guides 111, formed by slotting the shear-blade 112, said shear-blade being arranged parallel with the hammer proper for retraction thereby. The shear-blade 112 is yieldingly held depressed and receives its downward movement by means of an actuating-spring 113, connecting the same with the hammer proper, and the latter is provided with a projection 114 to engage a pin

115 on the blade, whereby upward movement is communicated from the hammer to the shear-blade. Coöperating with the hammer and shear-blade is the wedge-shaped former 116, yieldingly held extended across the guide-opening 108 in the path of the hammer-post 110, preferably by means of the leaf-spring 117, arranged on the exterior of the casing-body 102 and secured fast at one end thereto.

10 The staple-wire 118 enters the casing-body through a suitable opening therein and is fed by any suitable means, preferably by a device similar to the wire-feeding device shown in my former patent herein referred to. The staple-wire extends across the inclined or cam face of the staple-former 116, so that when the slotted shear-blade 112 descends the wire is cut and folded over the former 116, while the downward movement of the hammer-post 110 follows that of the shear-blade and presses back the former 116 and also carries the staple out of the slot within the shear-blade into and through the lapping parts of the dish-blank on the form-block. As the staple is thus driven through the material the points are deflected inward by the hollow die 105 and clenched by the clenching-plunger 107, mounted in the form-block member.

The upper end of the hammer 109 of each stapling device is attached to a reciprocatory head 119, to which is fastened one end of the operating-rod 120, sliding through the casing-body 102 and loosely connected at its lower end to the slotted extremity 121 of a bell-crank lever 122, fulcrumed intermediate its ends, as at 123, on a fulcrum-arm 124, having a plate portion 125 laterally adjustable on the supporting-bracket 126, mounted for vertical adjustment through the medium of the bolts and slots 127 on the frame or stand of the machine, it of course being understood that there is one of the supporting-brackets at each side of the machine to provide for the support of each stapling device and the bell-crank lever 122 for operating the same. In connection with each vertically-adjustable bracket 126 it is to be noted that the same is provided with a platform or table portion 128, on which is bolted for lateral adjustment a pedestal 129, which supports the casing-body 102 of the stapling device. By reason of the adjustable supporting-brackets 126 and the adjustable mounting of the stapling devices thereon it will be observed that said stapling devices may be adjusted laterally with relation to each other, so as to vary the distance between the separate members 103 of the form-block to provide for properly forming the dishes or trays of different sizes.

60 The bell-crank lever 122 for the operating-rod 120 for each stapling device is pivotally connected at its outer extremity to the upper end of an extensible link 130, which link is provided intermediate its ends with a turnbuckle 131 to provide for lengthening and shortening the same to vary the stroke of the staple forming and driving mechanism, and the

lower end of said extensible link 131 is connected to a crank-pin bolt 132, working in the longitudinal face-groove 133 of a cross-head crank-plate 134, mounted on the counter-shaft 135. A cross-head crank-plate 134 is mounted on each of the opposite ends of the counter-shaft 135 to provide for operating the separate stapling devices, and said counter-shaft 135 has mounted thereon at an intermediate point a spur-gear 136, meshing with a similar gear 137 on the main operating-shaft 53, whereby motion may be communicated from the shaft 53 to the shaft 135, thus providing for operating the feeding, cutting, stapling as well as the folding mechanisms from one shaft.

Through the medium of the crank connections with the bell-crank levers 122 motion is imparted to the reciprocatory heads 119 of both stapling devices, and these heads not only operate the staple forming and driving mechanism, but also the clenching-plungers 107. To provide for operating the clenching-plunger of each stapling device, a supplemental slide-rod 138 is employed. This rod is adjustably fastened at its upper end by means of the fastening 139 in the reciprocatory head 119 and is arranged flat against the operating-rod 120, so as to slide through the casing-body 102 therewith. The lower end of the rod 138 is arranged to work against the heel end 140 of a rock-lever 141, pivoted at an eccentric point within a recess at the under side of the form-block member 103. The end of the rock-lever 141 opposite the heel 140 projects through and engages in a slot 142, formed in the clenching-plunger 107. The movement of the head 119 in a downward direction causes the rod 138 to impart to the rock-lever 141 a quick movement, which will sharply thrust the clenching-plunger 107 upward and against the points of the staples at the moment the same enter the hollow die and are deflected toward each other by the flaring mouth of such die.

Coöperating with the form-block 100 and the stapling devices used in connection with each member of the form-block is a folder or folding mechanism arranged for movement above the said form-block. The folder properly essentially comprises a pair of oppositely-arranged downwardly-divergent side folding-plates 143 and a central clamp-plate 144, arranged between the side plates 143. The said side plates 143 are provided at their opposite ends with inturned end wings 145 and at their upper edges with the short inwardly-disposed top flanges 146, which top flanges embrace the bottom edges of the dish-blank when the holder registers on the form-block, while the end wings 145 of the side plates take over and fold inward upon each other the terminal side flaps F of the dish-blank, as will be readily understood. While the opposite downwardly-divergent side folding-plates 143 are constructed so as to fold upon the form-block the side portions D and the terminal side flaps F of the blanks, the central clamp-plate 144 accomplishes the folding in of the end tongues

E, and to secure this result the said clamp-plate 144 is provided at its opposite ends with the short downturned folding-flanges 147, which as the folder descends press against the end tongues E of the blank and force the same down upon the conical surface of the form-block before the side folding-plates 143 come into action and fold the terminal side flaps F upon said tongues in a proper position for having the staples clenched therethrough in the manner previously explained.

The downwardly-divergent side folding-plates 143 of the folder are fastened, respectively, to the opposite downwardly-divergent arms of the inverted substantially U-shaped head-plate 148, which is slidably mounted on the vertically-movable folder-stem 149, to the lower end of which stem is rigidly fastened the central clamp-plate 144. The said vertically-movable folder-stem is arranged to work through the vertically-alined guide-openings 150 and 151, formed, respectively, in the upper and lower brackets 152 and 153, carried by the supporting-standards 154, mounted on the adjustable brackets 126, which also support the stapling devices. The said folder rod or stem 149 has fitted thereon at an intermediate point between its ends an elongated sleeve 155, slidable therewith and formed at its opposite ends with the stop-collars 156, and said sleeve 155 is arranged to work through the lower guide-opening 151. Arranged on the folder-stem 149, between the upper end of the sleeve 155 and the upper bracket 152, is a pressure-spring 157, which spring exerts a normal downward pressure on the folder-stem to provide for forcing the central clamp-plate 144 in a direction toward the form-block 100; but when the head-plate 148 of the side folding-plates is in its elevated position the downward movement of the folder-stem is arrested and the central clamp-plate also held elevated in the position shown in Fig. 2 of the drawings, although it will be observed that as the head-plate, with the side folding-plates 143, descends the spring 157 will carry the central clamp-plate downward until it engages with the blank on top of the form-block. To provide for the downward thrust of the head carrying the side plates 143, there is preferably employed a pair of adjusting-rods 158, provided at their lower ends with flange-feet 159, bolted or otherwise securely fastened to the folder-head 148, and the upper ends of said rods 158 are pivotally connected with the centrally-arranged crank 160 of the horizontal oscillatory crank-shaft 161, journaled in suitable bearings of the oppositely-located supporting-standards 154 for the folding mechanism. The horizontal oscillatory rock-shaft 161 is provided at one end with a short crank-arm 162, to which is pivotally connected the upper end of the oscillating reciprocatory pitman 163, provided at a point near its lower end with a cam-plate portion 164, provided therein with a horizon-

tally-disposed sigmoidal cam-slot 165, receiving the cam-pin 166 of the crank-disk 167, mounted on the main operating-shaft 153. Below the cam-plate portion 164 thereof the pitman 163 is provided with a stem extension 168, slidably fitting in the fulcrum-block 169, swiveled to the machine-frame. The crank-disk 167 imparts a cam motion to the pitman 163, which in turn gives the necessary oscillation to the crank-shaft 161 to provide for the vertical reciprocation of the side portions of the folder. In connection with the operation of the folder it may be further explained that as the side folding-plates 143 descend the spring 157 also carries the central clamp-plate 144 onto the dish-blank and will fold upon the form-block the end tongues E of the blank before the side plates 143 come into action; but by reason of the sliding fit of the folder-head 148 on the folder-stem 149 the said head will continue to move downward after the central clamp 144 has stopped, and thereby cause the side plates 143 to fold the side portions and terminal side flaps of the blank in position for being stapled. When the folder-head rises from the completed butter dish or tray, the same engages with the lower end of the sleeve 155 and also lifts the central part or clamp 144 of the folder to an inoperative position.

To facilitate the removal of the dish from the form-block, the sliding head mounted on the folder-stem 149 preferably carries a releasing-spring 170, provided at its lower free end with a hook 171, adapted to engage with the dish or tray with sufficient firmness to remove the same from the form as the complete folder rises therefrom.

It has already been explained how the form-block 100 may be adjusted to provide for making dishes of different lengths by the spreading apart or moving together of the stapling devices carrying the separate members of the form-block; but the dishes not only vary in length, but also in depth, so that in order to provide for making the dishes of different depths the form-block is built up by shell forms corresponding in shape thereto and placed thereon. The shell forms, which are placed over the form-block, provide for making the dish of the proper length and depth; but when a shell form is fitted over the form-block it is necessary to adjust the brackets 126 in a vertical direction to bring the top of the new form flush with the knife-platen. In this way it will be seen that the machine can be readily adjusted for manufacturing different sizes of dishes.

The shell forms referred to are simply caps for the form-block, and one of the same is indicated by dotted lines on Fig. 3 of the drawings.

While the machine has been described with special reference to the making of butter or similar dishes from a sheet of veneer, still it will be understood that the machine would

operate with paper or any equivalent flexible sheet material which it might be desired to utilize in manufacturing the dishes.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described dish-making machine will be readily apparent to those skilled in the art without further description, and it will be understood that changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a dish-making machine, the combination with the cutting mechanism, of a feed-table, and a reciprocatory carriage supported by the table and having a pair of relatively fixed and movable clamp-fingers for the veneer, a friction-check device for arresting the movement of the carriage until said fingers grip the veneer, and means connected with the movable finger for moving it toward and from the fixed finger and for reciprocating the carriage, substantially as set forth.

2. In a dish-making machine, the combination with a cutting mechanism, of a feed-table having a longitudinal slideway, a reciprocatory feed-carriage having a friction-check device slidably working in the slideway, said carriage having also a pair of relatively fixed and movable clamp-fingers, and means connected with the movable finger for moving it toward and from the fixed finger and for reciprocating the carriage.

3. In a dish-making machine, the combination with the cutting mechanism, of a feed-table having a longitudinal slideway, a reciprocatory feed-carriage having a hollow slide-block registering in said slideway, and a clamp for the veneer, said hollow slide-block having opposite relatively fixed and movable side walls and interior pressure-springs for holding the movable side wall in frictional engagement with one side wall of the slideway, and operating mechanism for reciprocating the carriage and setting into action the clamp thereof, substantially as set forth.

4. In a dish-making machine, the combination with the cutting mechanism, of a feed-table having a longitudinal slideway, a reciprocatory feed-carriage having a yoke-frame carrying a slide-block working in said slideway, a lower clamp-finger slidably fitting in the upper side of the table and secured to said slide-block, vertically-movable clamp-slides mounted in the yoke-frame and carrying an upper clamp-finger lying directly above the lower clamp-finger, operating mechanism for reciprocating the carriage, and means, operated by said mechanism, for adjusting said clamp-slides, substantially as set forth.

5. In a dish-making machine, the combination with the cutting mechanism, of a sta-

tionary feed-table, a reciprocatory feed-carriage having a yoke-frame carrying a lower clamp-finger slidably fitting in the table, vertically-movable clamp-slides mounted in the side portions of the yoke-frame and carrying an upper clamp-finger lying above and co-extensive with the lower clamp-finger, said clamp-slides having projected from their outer sides rigid studs, longitudinally-movable adjusting-rods slidably supported at opposite sides of the yoke-frame and provided at one end with inclined slots receiving said studs, an upright swinging standard having at its upper end a cross-head, adjustable links connecting the ends of said cross-heads with said adjusting-rods, and means for operating said standard, substantially as set forth.

6. In a machine of the class described, the combination with the cutting mechanism, of a reciprocatory feed-carriage having a frame carrying a lower fixed clamp-finger, vertically-movable clamp-slides mounted in the carriage-frame and carrying an upper clamp-finger, adjusting-rods supported by the carriage-frame and having an operative connection with the clamp-slides, an upright swinging standard pivotally connected at its upper end with the adjusting-rods, a suitably-arranged operating-shaft, and an adjustable eccentric-rod connection between said shaft and said standard, substantially as set forth.

7. In a machine of the character described, a forming mechanism, a reciprocating feeder, and a combined cutting and holding mechanism arranged between the feeder and forming mechanism and adapted to fix the position of the blank during the backward movement of the feeder prior to gripping the stock, substantially as described.

8. In a machine of the character set forth, a forming mechanism, a feeder, a combined cutting and holding mechanism arranged between the feeder and forming mechanism, and actuating mechanism for sliding the feeder forward and advancing the previously cut and scored blank to the forming mechanism for operating the cutting and holding mechanism to grip, cut and score the blank during the backward movement of the feeder, substantially as specified.

9. In a dish-making machine, a stationary knife-platen, a vertically-reciprocating frame having a knife-head, longitudinally-disposed scoring-knives, and transversely-arranged cutting-knives springing from the scoring-knives and having their cutting edges in a lower plane than said scoring-knives, and a pair of horizontal presser-plates yieldingly supported by the knife-head and normally projected below the plane of the cutting edges of said knives to engage the veneer or stock in advance of the knives, said presser-plates being located exterior to the scoring-knives and provided with a plurality of notches open at their inner edges and receiving the cutting-knives, substantially as set forth.

10. In a dish-making machine, a stationary



knife-platen, a vertically-reciprocating frame having a knife-head provided in its under side with a plurality of intersecting knife-receiving grooves, a combination cutting and scoring knife having different members fitting in said grooves, and wedge-bolts mounted in the head and engaging with the knife to retain the same in place, substantially as set forth.

11. In a machine of the class described, the machine-frame provided upon opposite sides with vertically-arranged guides, a vertically-reciprocating frame-bearing, slitting and scoring knives, presser-plates adapted to move with and act in advance of the knives, standards pendent from the frame and working in said guides, a transverse operating-shaft journaled in the frame, and adjustable connections between the operating-shaft and the said pendent standards for imparting a reciprocating movement to said frame, said connections being adjustable to vary the depth of cut of the said knives and to maintain the operative relation of the presser-plates with respect thereto, substantially as set forth.

12. In a machine of the class specified, the combination with the machine-frame, the vertically-reciprocating knife-carrying frame provided with offstanding connecting pins or studs, and the operating-shaft having eccentrics, of extensible pitmen connecting said eccentrics with said pins or studs, each of said pitmen consisting of a head having a narrow arm extension, oppositely-disposed yokes embracing the head and its arm extension and provided within their closed ends with sectional adjustable bearings respectively for the eccentrics and said pins or studs, wedges between the said bearings and the terminals of the head and its extension, and a plurality of adjusting wedge-keys fitted in coincident openings of the arm extension and yoke thereof to provide for lengthening and shortening the pitman to vary the depth of cut of the knife, substantially as set forth.

13. In a dish-making machine, the combination with the sectional form-block and a folder, of a pair of oppositely-located stapling devices disposed to cooperate respectively with the form-block, means for relatively adjusting the sections of the form-block toward and from each other, to correspond to various sizes of blanks, and means for adjusting the stapling devices to correspond to the various positions of the forming-block sections, substantially as set forth.

14. In a dish-making machine, the combination with the sectional form-block and the folder movable toward and from the form-block, of a pair of oppositely-located obliquely-disposed stapling devices adjoining respectively, the sections of the form-block and cooperating therewith, means for adjusting the sections of the form-block toward and from each other, to correspond to various sizes of blanks, and means for adjusting the

stapling devices to correspond to the various positions of the forming-block sections.

15. In a dish-making machine, the combination with the sectional form-block bearing clenching devices, and the folder, of oppositely obliquely-disposed stapling devices, means for adjusting the sections of the form-block toward and from each other, to correspond to various sizes of blanks, and means for adjusting the stapling devices to correspond to the various positions of the form-block sections.

16. In a dish-making machine, the combination with the sectional form-block, of frusto-conical form bearing clenching devices and the movable folder, of obliquely-disposed stapling devices arranged at the side of the form-block, means for adjusting the sections of the form-block toward and from each other to correspond to various sizes of blanks, and means for adjusting the stapling devices to correspond to the various positions of the form-block sections.

17. In a dish-making machine, the combination with the cutting mechanism, of a pair of oppositely-arranged stapling devices each carrying a form-block member or half, and the folder movable toward and from the form-block, substantially as set forth.

18. In a dish-making machine, the combination with the cutting mechanism, of a pair of oppositely-arranged laterally and vertically adjustable stapling devices, each carrying a form-block member or half, and the folder movable toward and from the form-block, substantially as set forth.

19. In a dish-making machine, the combination with the cutting mechanism, of a pair of oppositely-arranged oblique stapling devices each having a casing-body formed at its lower end with a form-block member or half, the separate members or halves of the form-block being alined, and the folder movable toward and from the form-block, substantially as set forth.

20. In a dish-making machine, the combination with the cutting mechanism, of a stationary form-block, provided in opposite portions thereof with openings, reciprocatory clenching-plungers working in the form-block openings, a pair of oppositely-located stapling devices having casing-bodies adjoining the form-block, staple forming and driving mechanism mounted in the casing-body of each stapling device in alinement with the clenching-plunger, a reciprocatory head connected with said staple forming and driving mechanism of each stapling device, a longitudinally-movable operating-rod connected at one end with said head, operating connections for said rod, a rock-lever mounted in each portion of the form-block and connected at one end with the clenching-plunger therein, and a supplemental slide-rod having one terminal engaging with the opposite end of said rock-lever and its other terminal fitted in said reciprocatory head, substantially as set forth.

21. In a dish-making machine, the combi-

nation with the cutting mechanism, of a sectional form-block, a pair of oppositely-located stapling devices adjoining the form-block, means for adjusting the stapling devices and form-block sections toward and from each other, a reciprocatory head for operating the staple forming, driving and clenching mechanism of each stapling device, an operating-rod connected with said head, a suitably-arranged shaft having a cross-head crank-plate, an extensible link having a crank-pin connection at one end with said crank-plate, and a bell-crank lever operatively connecting the opposite end of said link with one end of said operating-rod, substantially as set forth.

22. In a dish-making machine, the combination with a form-block, of a flat clamp-plate having opposite terminal folding-flanges, and a head-plate movable independently of the clamp-plate and provided with oppositely-disposed divergent folding-plates between the folding-flanges of the clamp-plate.

23. In a dish-making machine, the combination with the form-block, of a flat relatively-movable clamp-plate having folding-flanges at opposite ends, a substantially U-shaped head-plate movable independently of the clamp-plate, and divergent folding-plates located opposite the spaces between the folding-flanges of the clamp-plate and secured to the members of the U-shaped head-plate.

24. In a dish-making machine, the combination with the cutting mechanism, and the stationary form-block, of a reciprocatory folder consisting of a central clamp-plate provided at its terminals with short downturned folding-flanges, and oppositely-arranged downwardly-divergent side folding-plates provided at their ends with inturned wings and at their upper edges with short inwardly-disposed flanges, and means for operating the separate members of the folder synchronously and independently, substantially as set forth.

25. In a dish-making machine, a form-block, a reciprocating stem, means for positively moving said stem toward the form-block, spaced stops for limiting the movement of said stem, a head-plate slidable upon the said stem between the stops thereof and having spaced folding-plates, and a clamp-plate applied to the lower end of the stem and having opposite terminal folding-flanges located in the spaces formed between the folding-plates, substantially as set forth.

26. In a dish-making machine, the combination with the frame having supporting-standards, of a reciprocatory folder having a central member and a head carrying side

members, a spring-operated stem mounted in suitable guides carried by the standards and connected with said central member, a rock-shaft supported by the standards and having a centrally-arranged crank, and a terminal crank-arm, rods connecting said central crank with the head carrying the side members of the folder, a suitably-arranged shaft carrying a crank-disk, a swiveled fulcrum-block arranged at one side of said crank-disk, and a pitman connected at one end with the terminal crank of the rock-shaft and having its other end slidably engaging the fulcrum-block, said pitman having intermediate its ends a cam-plate portion provided with a sigmoidal slot receiving the pin of the crank-disk, substantially as set forth.

27. In a dish-making machine, a form-block composed of sections, means for adjusting the sections toward and from one another, a shell form removably fitted to the adjustable form-block, and folding mechanism coöperating with the form-block, substantially as specified.

28. In a dish-making machine, the combination with the cutting mechanism, of a feed-table, and a reciprocatory carriage supported by the table and having a pair of relatively fixed and movable clamp-fingers for the veneer, means connected with the clamp and carriage for operating the clamp and subsequently moving the carriage, said means having a limited sliding movement with respect to the carriage, and a friction-check device for arresting the movement of the carriage until said means has reached the limit of its movement to grip or release the veneer.

29. In a dish-making machine, the combination with the knife-platen and the cutter, of a feed-table, a reciprocatory carriage supported by the table and having a fixed clamp-finger, a movable clamp-finger mounted upon the carriage, rods having a limited sliding movement upon the carriage, connections between the rods and the movable finger for operating the finger during the slidable movement of the rod, and means connected with said rod for moving the carriage and adapted to move the rods to operate the movable finger.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

THOS. CREBBIN.

Witnesses:

W. K. SPILLER,  
G. W. FENIMORE.