

No. 828,397.

PATENTED AUG. 14, 1906.

S. B. FRIDAY.
BUTTER CUTTING MACHINE.

APPLICATION FILED JAN. 2, 1906.

2 SHEETS—SHEET 1.

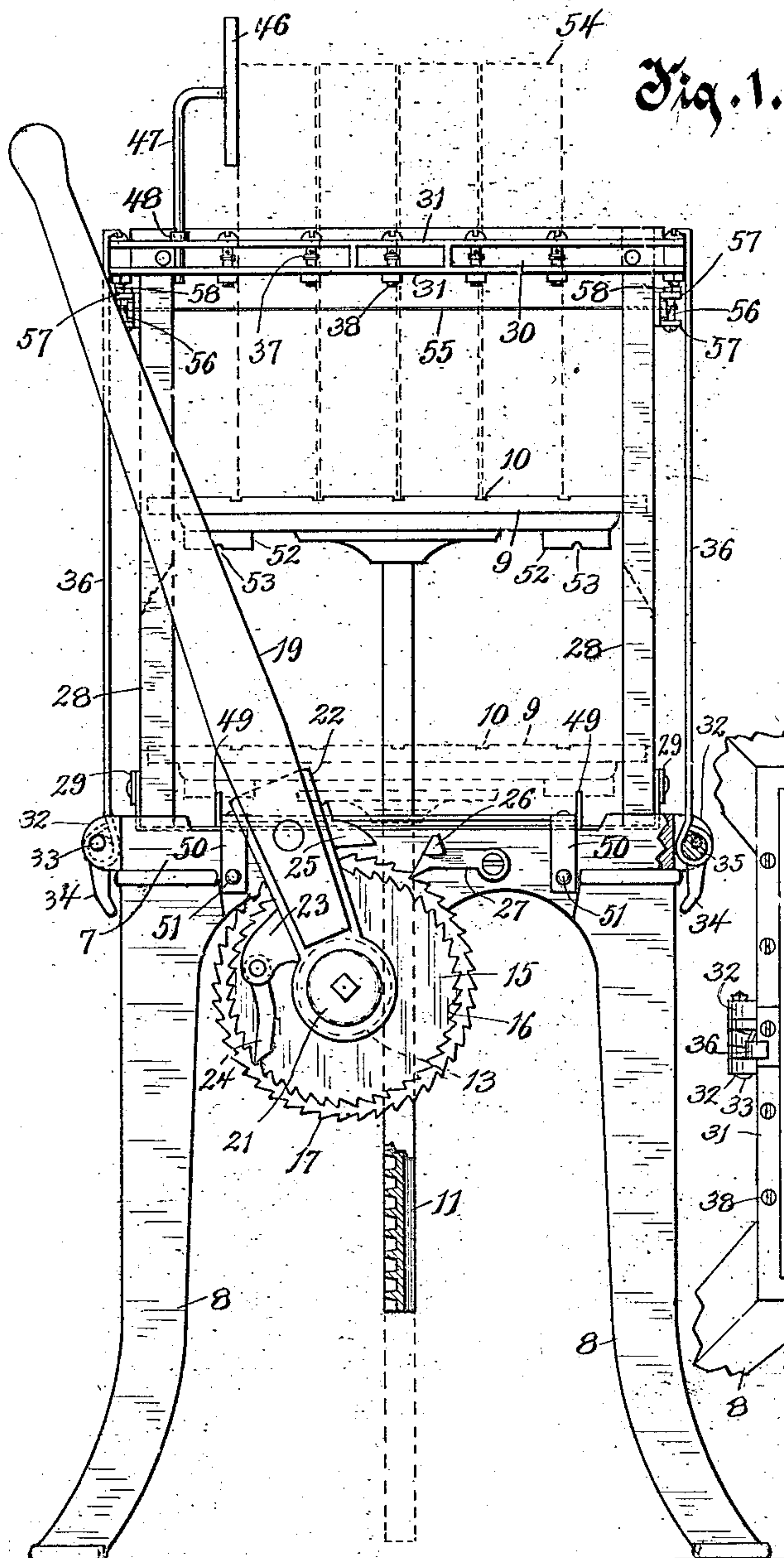


Fig. 1.

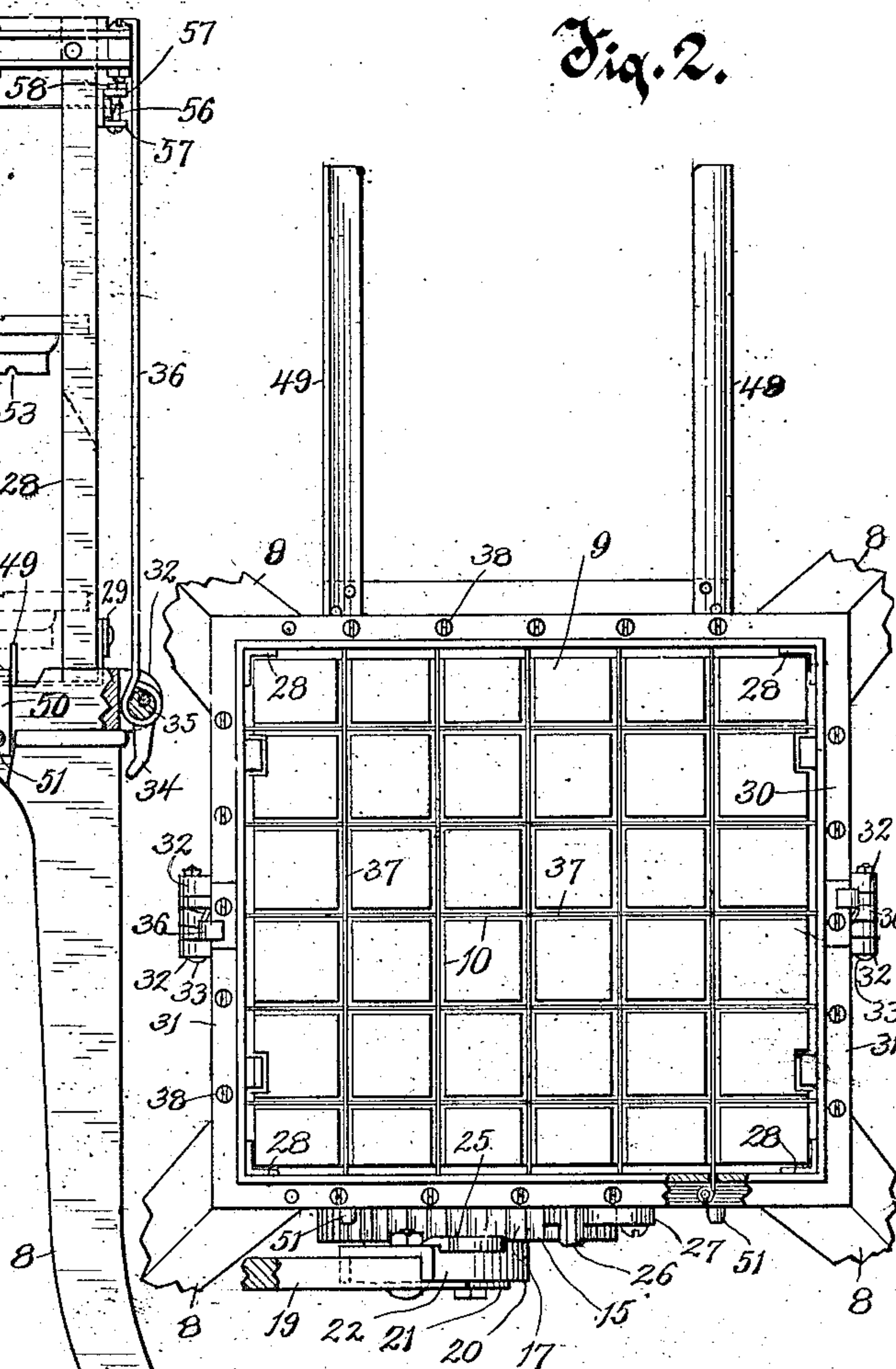
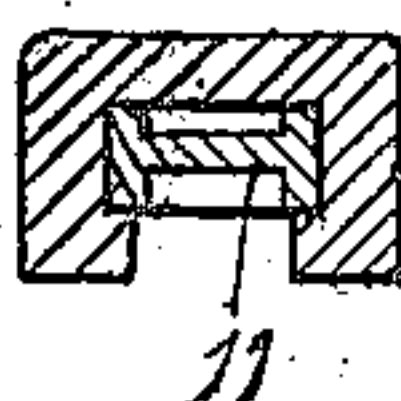


Fig. 2.

Fig. 7.



Witnesses.
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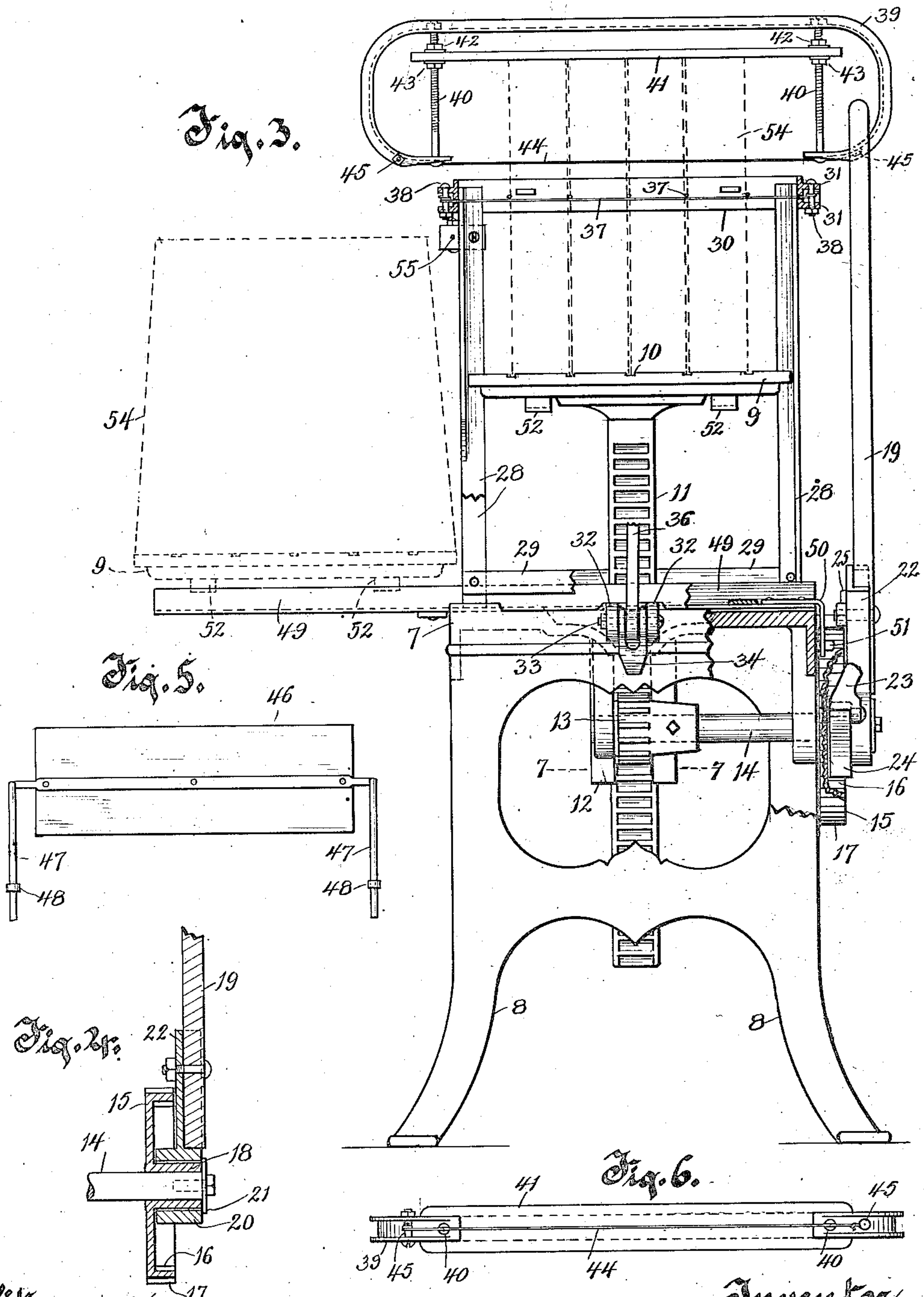
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

SOLOMON B. FRIDAY, OF BRANDON, WISCONSIN.

BUTTER-CUTTING MACHINE.

No. 828,397.

Specification of Letters Patent.

Patented Aug. 14, 1906.

Application filed January 2, 1906. Serial No. 294,076.

To all whom it may concern:

Be it known that I, SOLOMON B. FRIDAY, residing in Brandon, in the county of Fond du Lac and State of Wisconsin, have invented new and useful Improvements in Butter-Cutting Machines, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in butter-cutting machines.

One of the objects contemplated is to provide a device of such character that simplicity and cheapness in construction and adaptability for ready cleaning are secured.

A further object is to provide an improved construction adapted to operate upon a mass of butter immediately after the removal of said mass from a tub, so that the butter when it enters the machine and is ready to be operated upon is of the required vertical height to permit of a plurality of horizontal layers of equal thickness being cut therefrom.

A further object is the provision of means after the butter has been vertically cut for regulating the horizontal cut of a mass, so that the butter may be divided into a series of square or rectangular prints or cakes of predetermined proportions and weight.

With the above and other incidental objects in view the invention consists of the devices and parts or their equivalents, as hereinafter set forth.

In the accompanying drawings, Figure 1 is an elevation of one side of the machine. Fig. 2 is a plan view, parts broken away. Fig. 3 is a side elevation at right angles to Fig. 1. Fig. 4 is a sectional view through the gear-wheel and fragment of the operating-handle. Fig. 5 is a detail view of the removable guard-board. Fig. 6 is an under view of the horizontal cutter, and Fig. 7 is a transverse section on the line 7 7 of Fig. 3.

The frame of the table of the machine may be of any desirable construction adapted for supporting the several parts, and in the drawings I have illustrated a table 7, provided with depending legs or supports 8.

A follower 9, provided on its top surface with kerfs 10, is arranged above the top of the table and when at the lowest limit of its adjustment rests on said table-top. Vertical movement may be imparted to the follower in any desirable manner; but I prefer

to employ the mechanism shown in the accompanying drawings and which will now be explained. The follower is supported by a rack-bar 11, which extends through a suitable guide-opening in the table-top and also through a suitable guide 12, integral with the frame and continuing in line with the guide-opening of the table-top. The teeth of this rack-bar are engaged by a pinion 13 at the inner end of a shaft 14, said shaft carrying at its outer end a ratchet-wheel 15. This ratchet-wheel has its periphery flanged outwardly, and ratchet-teeth 16 are arranged around the inner surface of this flange, while around the outer surface of the flange are arranged other teeth 17. The wheel 15 is provided with an outwardly-extending hub 18, which surrounds the shaft 14 and is fast thereto.

The numeral 19 indicates an operating-handle. The lower end of this handle is provided with a circular bearing 20, which loosely surrounds the hub 18 and is prevented from working outwardly off the said hub by reason of a stop-plate 21, secured to the outer end of the shaft 14. The circular bearing 20 also has a slight play between the stop-plate 21 and the outer face of the ratchet-wheel 15. The operating-handle is preferably of wood. In the most usual form of construction a hand operating metallic wheel is employed. This is open to objection in view of the fact that it soils the hands of the operator and necessitates his washing his hands after each operation before he can handle the butter. By the use of a wooden handle this is obviated. Where the wooden handle is employed, the circular bearing 20 is formed at the lower end of arm 22, which is bolted to the lower portion of the handle proper. From one edge of the lower portion of the handle extends a lug 23, and to this lug is pivoted a pawl 24, said pawl adapted to engage the ratchet-teeth 16. From the opposite edge of the handle and at a point slightly above the lug 23 extends a projection 25, said projection after the handle has been swung a certain distance in one direction adapted to engage under a shoulder 26, projecting laterally from a pawl 27, said pawl pivoted to one of the sides of the top portion of the frame and adapted to engage the teeth 17.

Usually in this class of machines the table

has mounted thereon a casing or box of rectangular form in which the follower works up and down, the butter to be cut being placed in the casing or box and supported by the follower. One of the important features of my invention is the dispensing of the casing and employing in lieu thereof a skeleton frame, which forms a guide for the movement of the follower. By this arrangement cheapness and simplicity are secured, the butter can at all times be seen, the necessity for cleaning the interior of the casing or box is avoided, and the comparatively few parts which are required to be cleaned are readily accessible. Referring to this portion of my invention, the numerals 28 indicate four upright guide-posts which are shown as of right-angular form in cross-section, although they may be of curved form in cross-section or, in fact, of any other desired contour, so long as they receive the corners of the follower, and thereby serve as a guide for the follower in the movement thereof. These uprights are connected near their lower ends by connecting-bars 29, and the lower ends of the uprights rest on top of the table. To the upper ends of the posts or uprights is riveted a rectangular cutting-wire-carrying frame 30. This frame may be of any desirable construction; but I prefer to construct it of a flat band of metal of rectangular form, having its top and bottom edges provided with outwardly-extending flanges 31. This frame, with its rigid depending posts, is held tightly but releasably to the table. This may be accomplished in a variety of different ways, and in the drawings I have shown a specific mechanism for obtaining the object desired. Referring to this mechanism, the numerals 32 32 indicate lugs projecting outwardly from two of the opposite sides of the table-top. The lugs of each pair form bearings for a pin 33. Between the lugs is fitted the furcate member of the upper bifurcated end of a handle 34, the said furcate members being rigidly connected by means of a transverse rounded connecting member 35. Each of the members 35 is provided longitudinally therethrough with an eccentric opening through which one of the pins 33 passes freely, so that the member 35 is free to turn on this pin. The pin also passes freely through aligned openings in the furcate arms. For each cam is employed a clamping-rod 36. The lower end of each clamping-rod is connected to one of the eccentrics or cams, preferably by being bent therearound, and thereby rigidly connected thereto. The upper end of each clamping-rod is turned inwardly, so as to adapt said rod to engage over the flange 31 of the cutting-wire-carrying frame 30. When these clamping-rods are turned upwardly and inwardly, their inwardly-bent upper ends are caused to engage over the flange referred to. After so turning the clamping-rods the

handles 34 of each cam are turned downwardly, and the skeleton frame is thereby tightly clamped to the table. Whenever it is desired to remove the skeleton frame, all that is necessary to be done is to push upwardly on the handles of the cams, and the clamping-rods can then be turned out of engagement with the upper flange 31, and the frame with its depending uprights or posts is free to be lifted out of engagement with the table.

The crossed cutting-wires of the wire-carrying frame are indicated by the numerals 37 37. The outer ends of these wires are preferably secured to the frame in such manner that slack may be readily taken up, and this is secured by passing the ends of the wire through openings in the upright walls of the frame and wrapping said ends around small screw-bolts 38, extending through the flanges 31, the heads of said bolts resting against one of said flanges and nuts being turned onto the threaded opposite ends of the bolts and against the other flanges.

In the use of the invention as thus far disclosed the skeleton frame is secured to the top of the table in the manner hereinbefore described. The follower 9 at the initial stage of the operation should be in its lowest position, and the mass of butter is placed on said follower. The operating handle or lever 19 is now grasped and moved back and forth. This will cause the pawl 24 to successively engage the teeth 16 of the ratchet-wheel 15. The ratchet-wheel is thereby rotated and its rotation communicated to the shaft 14, and the pinion 13 on the inner end of said shaft is necessarily rotated with the shaft. In view of the fact that the pinion 13 is in mesh with the rack-bar 11 the said rack-bar is caused to be raised and the follower 9, supported by the upper end of said rack-bar, simultaneously raised. The mass of butter supported on the follower is thus brought into contact with the cutting-wires 37 and is thereby divided by a series of vertical cuts. After the butter is forced upwardly a certain distance the operator ceases to move the handle back and forth, and the pawl 27 in engagement with the teeth 17 serves to hold the shaft 14 stationary, and hence the follower is maintained in its raised position. When the follower is stopped in the manner indicated, the butter which had been previously cut vertically is now cut horizontally, so as to form a number of rectangular prints or cakes. The kerfs or grooves 10 in the upper side of the follower compensate for the bowed or arched form which the crossed cutting-wires assume in passing through the butter, and hence permit movement of the follower upwardly a sufficient distance to allow the bow to enter the grooves in order to complete the vertical cut.

For the purpose of cutting the vertically-cut butter horizontally into cakes or prints of

predetermined size and weight I employ an improved device consisting of an arched or bowed frame 39, which is advisably made channeled or U-shaped in cross-section. The ends of this frame are turned inwardly toward each other for a short distance, as clearly shown, and extending from these turned-in ends to the top piece of the frame are threaded rods 40. These rods pass freely through openings in a gage-bar 41. Engaging the threads of the rods above the gage-bar are nuts 42 42, and engaging the threads of the rods below the gage-bar are nuts 43 43. If it is desired to adjust the gage-bar upwardly, the nuts 42 are turned upwardly on the rods, and this permits the gage-bar to be moved upwardly, and it is held in its upwardly-adjusted position by turning the lower nuts 43 upwardly thereagainst. When it is desired to lower the gage-bar, the nuts 43 are turned downwardly on the rods, and this permits the gage-bar to lower, and it is clamped in such lower position by turning the nuts 42 downwardly against the upper side thereof. A cutting-wire 44 is connected at its opposite ends to the inwardly-turned ends of the bowed frame at the points 45 45, and as a convenient means for guiding the wire to the points of attachment I pass said wires into the grooves in the heads of the threaded rods 40.

In the use and application of the horizontal cutter the gage-bar is adjusted on the rods 40 the distance it is required that the height of the cakes of butter should be, it being known that the cakes of butter of the transverse area, as determined by the wires 37, and of the height equal to the distance from the cutting-wire 44 to the adjusted position of the gage-bar will be of a given weight. After the mass of butter has been elevated a desired distance above the table-top the horizontal cutter is adjusted to the mass of butter, as illustrated in Fig. 3, and is then drawn across the mass, the wire 44 in this movement of the device entering the butter and serving to cut said butter horizontally. Of course when the wire 44 is drawn completely through the mass of butter a number of prints or cakes of butter will have been completely cut of a given size and known weight. In thus drawing the cutting-wire 44 through the mass of butter there is a tendency of the butter as it is severed being drawn off the machine and falling to the floor. In order to prevent this, I provide a removable stop-board 46, said board provided with depending legs 47, which are adapted to be removably fitted in suitable openings in the top skeleton frame 30, the legs being provided with shoulders 48, resting upon the tops of the upper outstanding flanges of the frame 30. This stop-board is only adjusted to the machine just before the operation of cutting the butter horizontally is commenced. The

legs fit freely in the openings in the frame 30, so that after each horizontal cutting of the butter is completed the board may be removed.

In the forms of butter-cutters wherein the follower moves in a rectangular casing the butter is simply placed on top of the follower and packed in the casing. Of course where the specific open form of guide-uprights for the follower herein shown and described is employed the butter cannot be packed, as is the case when the casing form of construction is used. The open form of construction herein shown and described, therefore, is intended to be used in connection with a complete tapering cylinder of butter, this being the form of the butter when first removed from a tub. In order to provide a convenient means for inserting this cylinder of butter into the open frame, I provide two L-shaped rails 49 49, which extend over the table-top and out laterally from said top for a desired distance. The rails are preferably removably secured, and for this purpose I bolt to the ends thereof opposite to the outwardly-extending ends straps 50 50, which are bent downwardly, said downwardly-bent portions provided, near their lower ends, with eyes, which are adapted to receive therein studs 51 51, projecting out from one side of the table. The follower 9 is initially placed upon the outwardly-extending portions of the rails 49, as shown by dotted lines in Fig. 3. For the purpose of slidably holding the follower to the rails I provide on the under side of said follower strips 52 52, which are provided with grooves 53 53, adapted to fit the upper edges of the upright flanges of the L-rails. The tapering cylinder of butter (indicated by dotted lines in Fig. 3 and designated by the numeral 54) is placed upon the follower, and the said follower is then pushed inwardly until the advancing edge thereof strikes the guide posts or uprights toward which the said edge of the follower is moving, and the follower is thereby properly positioned between the four uprights. It will be understood that the two uprights between which the follower is first moved has its flanges which face the advancing edge of the follower cut away at their lower portions, so that said flanges offer no impediment to the advance between the two uprights in question of the advancing edge of the follower. This cut-away portion is clearly indicated in Fig. 3 of the drawings. When the follower is pushed into final position, the upper enlarged end or head of the rack-bar 11 will be beneath the central portion of the follower, so as to raise the said follower when the rack-bar is moved upwardly.

The average height of a cylinder of butter contained in an ordinary tub is too great for three horizontal cuts or layers of equal thickness. It is obvious that when the height of

the cylinder of butter is thus in excess of a certain height the last horizontal layer of butter after the final cut is thicker than the other layers. It will be understood that the cutting-wire 44 of the horizontal cutter is intended to make only two cuts horizontally through the butter, so that the butter remaining after the second cut represents the last layer, and if the cylinder of butter is too high this layer is necessarily of greater thickness than the other layers. It therefore follows that the height of the cylinder of butter should be just sufficient to provide for three horizontal layers of equal thickness. In order to secure this result, I employ a cutting-wire 55, stretched from one of the uprights 28 to the opposite upright and located near the upper ends of said uprights. A means for taking up slack in this wire is advantageously employed, and any desired means for the purpose may be used; but I prefer the means illustrated in the accompanying drawings, consisting of wrapping the ends of the wire 55 around and securing the same to bolts 56 56, said bolts passing freely through openings in lugs 57 57. One end of each of these bolts is provided with a head bearing against one of the lugs, and the opposite end of each bolt is threaded to receive a nut 58, located above the other lug. When the wire becomes slack, it is obvious that all that is necessary to be done is to loosen one of the nuts 58 and then engage the groove of the head of the bolt with a screw-driver or other implement and turn the bolt in a direction to wind the wire upon the bolt. When the proper tension is secured, the nut is then again tightened against the lug adjacent thereto. It is obvious that when the cylinder of butter is moved inwardly, as hereinbefore described, the wire 55 engages the butter and cuts off a thin slice from the upper end of said butter.

After the operation of cutting the butter is fully completed it is of course necessary to lower the rack-bar 11 and the follower 9 supported thereby. This is accomplished by thrusting the operating-handle 19 toward the right of Fig. 1 sufficiently far to cause the projection 25 to engage under the lateral shoulder 26 of the pawl 27. This will have the effect of raising the said pawl out of engagement with the teeth 16 of the gear-wheel. The support for the rack-bar and follower is thereby removed, and consequently they descend by gravity, the rack-bar in its downward movement operating upon the pinion 13 and causing the shaft 14 and the gear-wheel 15 to rotate in an opposite direction to the direction of rotation for raising the rack-bar. The rapidity of rotation may be regulated by pressing the handle inwardly, so as to cause it to bear frictionally against the edge of the outstanding flange of the gear-wheel 15. From Fig. 4 of the drawings and as hereinbefore previously pointed out it

will be seen that the bearing 20 at the lower end of the operating-handle has a loose fit around the hub 18 and a slight play longitudinally on said hub, so that this frictional engagement may be readily accomplished.

While the present drawings illustrate the open frame, consisting of the guide-uprights 28 and the top rectangular frame 30, yet I do not wish to be understood as limiting myself thereto, inasmuch as other features of my invention possess novelty irrespective as to whether they are employed in connection with an open frame or in connection with a closed casing. When a closed casing is employed, however, the rails 49 and related parts are not necessary, and the follower may be rigidly connected to the upper end of the rack-bar. I also do not wish to be understood as limiting myself to the exact details of construction herein shown and described, inasmuch as variations and changes may be made without departing from the spirit and scope of the invention.

While I have throughout the specification and claims designated the invention as a "butter-cutting machine," yet I do not intend to thereby limit myself to that special adaptation of the mechanism, inasmuch as said mechanism may be equally useful as a device for cutting cheese and like articles.

What I claim as my invention is—

1. In a butter-cutting machine, the combination of a supporting-table, a frame for containing the butter, cutting mechanism at the outer end of the butter-containing frame, a follower within the butter-containing frame and movable therein and adapted to support the butter, a rack-bar for imparting vertical movement to the follower, a shaft having a pinion on its inner end engaging the rack-bar, and a gear-wheel on its outer end, said gear-wheel having a flanged periphery with teeth around the inner surface of the flange, and teeth around the outer surface of said flange, an operating-handle rotatably fitted on the end of the shaft, and having a pawl pivoted thereto and engaging the teeth around the inner surface of the flange of the gear-wheel, and a pawl pivoted to the table and engaging the outer teeth of the gear-wheel, said pawl adapted to be engaged by the operating-handle and lifted out of engagement with the outer teeth of the gear-wheel, when said handle is moved a certain distance in one direction.

2. In a butter-cutting machine, the combination of a supporting-table, a frame for containing the butter, cutting mechanism at the outer end of the butter-containing frame, a follower within the butter-containing frame and movable therein and adapted to support the butter, a rack-bar for imparting vertical movement to the follower, a shaft having a pinion on its inner end engaging the rack-bar, and a gear-wheel on its outer end, said gear-wheel having a flanged periphery with teeth

around the inner surface of the flange, and teeth around the outer surface of said flange, an operating-handle rotatably fitted on the end of the shaft, and having a pawl pivoted thereto and engaging the teeth around the inner surface of the flange of the gear-wheel, a pawl pivoted to the table and engaging the outer teeth of the gear-wheel, said pawl provided with a lateral shoulder, and a projection extending from the operating-handle, and adapted to engage the shoulder of the said pawl when the operating-handle is moved a certain distance in one direction.

3. In a butter-cutting machine, the combination of a supporting-table, a frame for containing the butter, cutting mechanism at the outer end of the butter-containing frame, a follower within the butter-containing frame and movable therein and adapted to support the butter, a rack-bar for imparting vertical movement to the follower, a shaft having a pinion on its inner end engaging the rack-bar, and a gear-wheel on its outer end, said gear-wheel having a flanged periphery with teeth around the inner surface of the flange, and teeth around the outer surface of said flange, a wooden operating-handle rotatably fitted on the end of the shaft, and having a pawl pivoted thereto and engaging the teeth around the inner surface of the flange of the gear-wheel, and a pawl pivoted to the table and engaging the outer teeth of the gear-wheel, said pawl adapted to be engaged by the operating-handle and lifted out of engagement with the outer teeth of the gear-wheel, when said handle is moved a certain distance in one direction.

4. In a butter-cutting machine, the combination of a supporting-table, a frame for containing the butter, cutting mechanism at the outer end of the butter-containing frame, a follower within the butter-containing frame and movable therein and adapted to support the butter, a rack-bar adapted when actuated to move the follower within the frame, a shaft having on its inner end a pinion meshing with the rack-bar, and provided on its outer end with a flanged gear-wheel, the said flange having teeth around its inner surface, and teeth around its outer surface, an operating-handle loosely fitted on the outer extremity of the shaft and adapted to have an inward play so as to be brought into frictional engagement with the gear-wheel, and thereby regulate the speed of the reverse rotation of said gear-wheel, a pawl pivoted to the handle and adapted to engage the inner teeth of the gear-wheel, and a pawl pivoted to the table and adapted to engage the outer teeth of the gear-wheel, the said pawl adapted to be engaged by the operating-handle, and lifted out of engagement with the outer teeth of the gear-wheel, when said handle is moved a certain distance in one direction.

5. In a butter-cutting machine, the combi-

nation of a supporting-table, a frame for containing the butter, cutting mechanism for dividing the butter into a number of subdivisions, means for bringing the butter within the butter-containing frame into engagement with the cutting mechanism, and a combined gage and cutter, consisting of a frame having a longitudinal member and end members at angles to the longitudinal member, the extremities of said end members being bent inwardly for slight distances parallel with the longitudinal member, a cutting-wire connecting said inwardly-bent portions of the end members, rods extending from the inwardly-bent portions of the end members to the longitudinal member, a gage-bar through which the rods pass, and means for holding said gage-bar at adjusted position on the rods, said combined gage and cutter, after the gage-bar thereof has been set a desired distance above the cutting-wire, adapted to be drawn across the mass of butter so as to cause the wire to effect a cut through the subdivided butter at right angles to the first-referred-to cuts, to thereby divide the butter into cakes of predetermined proportions and weight.

6. A combined gage and cutter, consisting of a frame having a longitudinal member and end members at angles to the longitudinal member, the extremities of said end members being bent inwardly for slight distances parallel with the longitudinal member, a cutting-wire connecting said inwardly-bent portions of the end members, rods extending from the inwardly-bent portions of the end members to the longitudinal member, a gage-bar through which the rods pass, and means for holding said gage-bar at adjusted position on the rods.

7. A combined gage and cutter, consisting of a frame having a longitudinal member and end members at angles to the longitudinal member, the extremities of said end members being bent inwardly for slight distances parallel with the longitudinal member, a cutting-wire connecting said inwardly-bent portions of the end members, screw-rods extending from the inwardly-bent portions of the end members to the longitudinal member, a gage-bar through which the screw-rods freely pass, and nuts turnable on the screw-rods above and below the gage-bar.

8. In a butter-cutting machine, the combination of a supporting-table, guide-posts extending therefrom, cutting mechanism at the outer ends of the guide-posts, rails extending outwardly from the supporting-table, a follower adapted to be supported by said rails and to be pushed inwardly thereon to a position between the guide-posts and means for moving the follower when so positioned in a direction toward and away from the cutting mechanism.

9. In a butter-cutting machine, the combi-

nation of a supporting-table, guide-posts
extending therefrom, cutting mechanism at
the outer ends of the guide-posts, rails ex-
tending outwardly and removable from the
5 supporting-table, a follower adapted to be
supported by said rails and to be pushed in-
wardly thereon to a position between the
guide-posts, and means for moving the fol-

lower, when so positioned, in a direction to-
ward and away from the cutting mechanism. 10

In testimony whereof I affix my signature
in presence of two witnesses.

SOLOMON B. FRIDAY.

Witnesses:

J. W. FOSTER,

EDITH FOSTER.