No. 834,887. PATENTED NOV. 6, 1906.

D. I. CALHOUN.

DOUGH DIVIDER.

APPLICATION FILED FEB. 25, 1905. RENEWED FEB. 21, 1906.

4 SHEETS—SHEET 1.

Fig. 1.

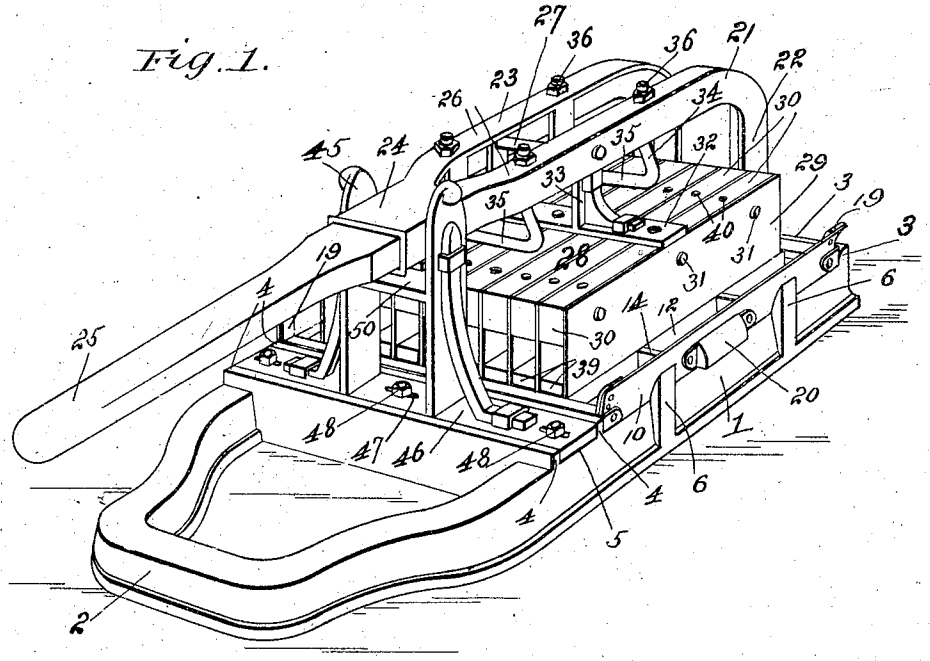
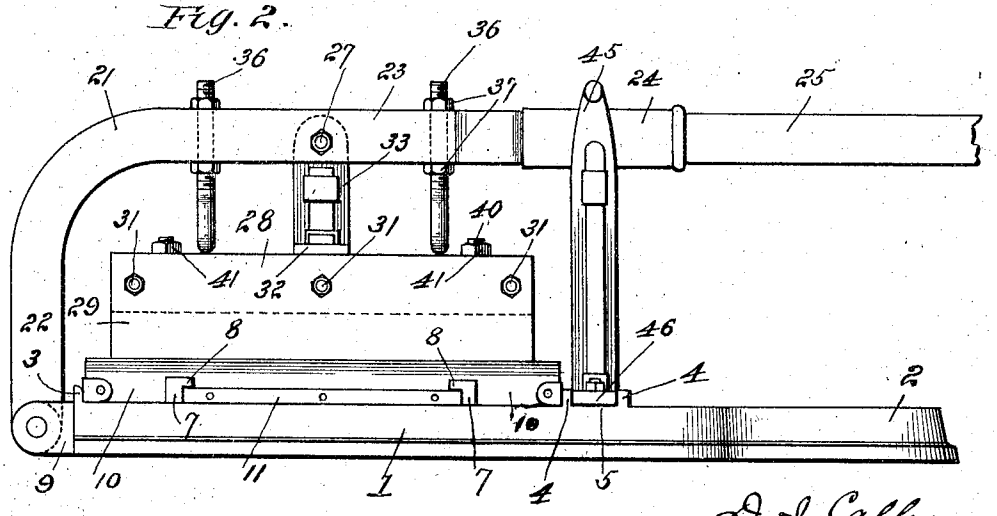


Fig. 2.



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4 SHEETS—SHEET 2.

Fig. 3.

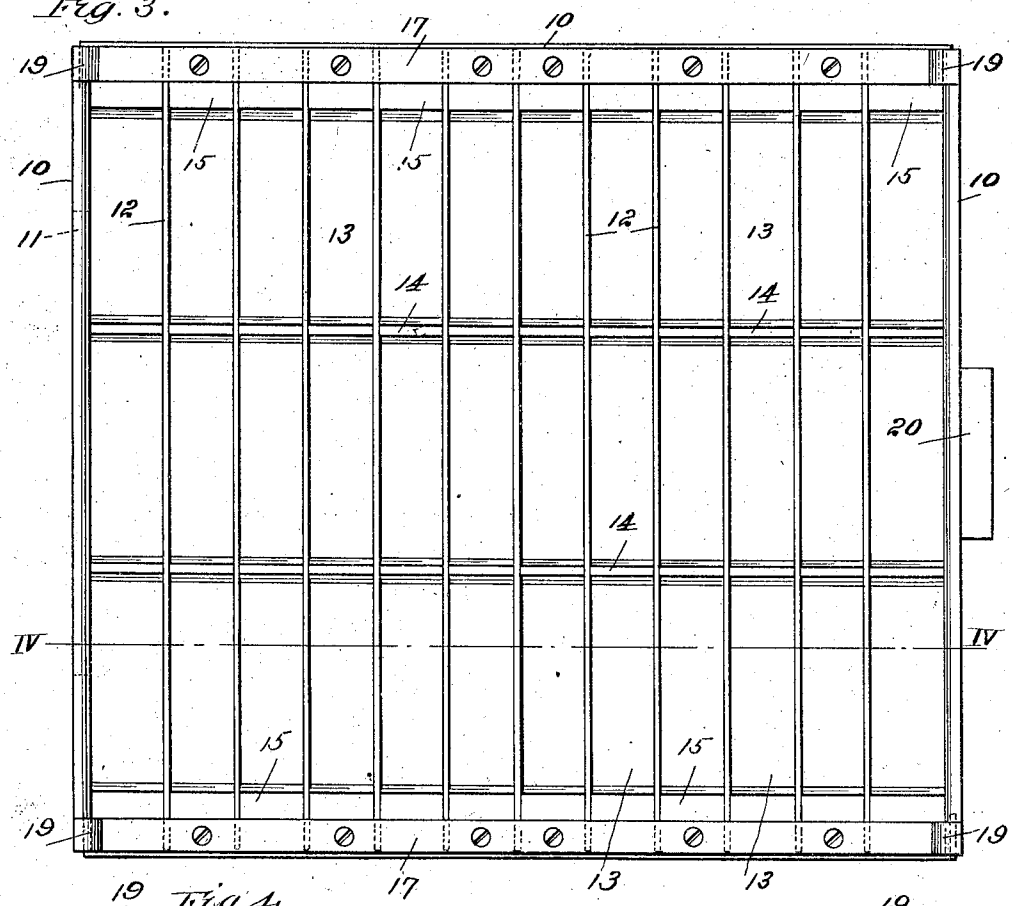


Fig. 4.

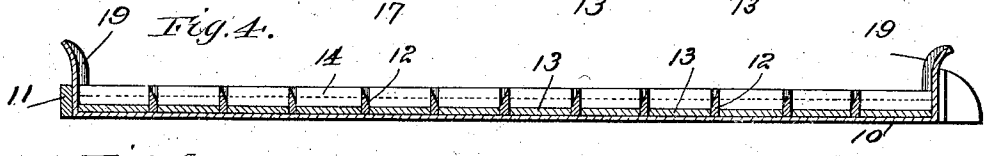


Fig. 5.

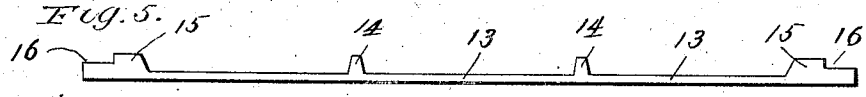


Fig. 6.

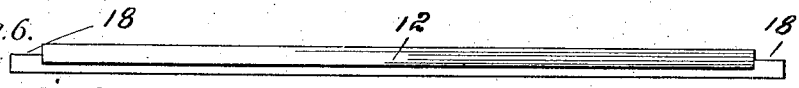


Fig. 7.

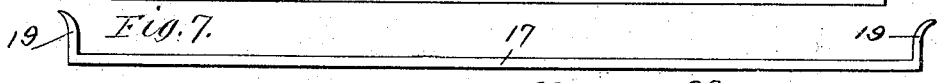
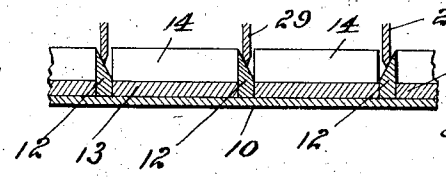


Fig. 8.



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4 SHEETS—SHEET 3.

Fig. 9.

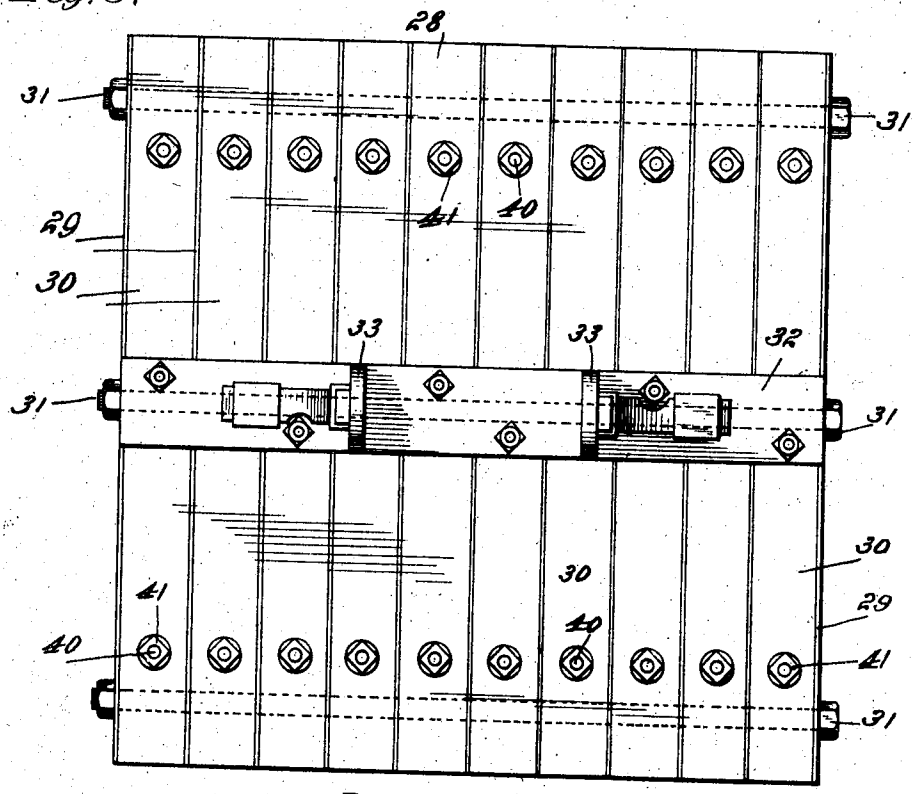


Fig. 10.

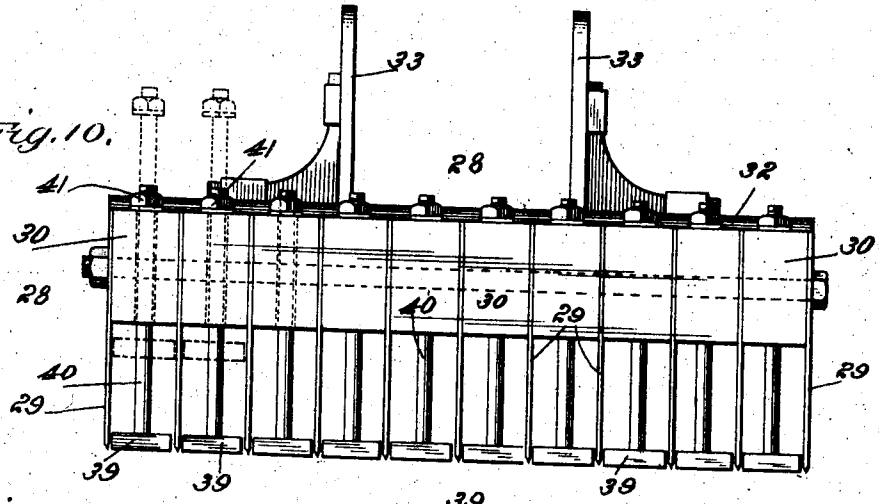
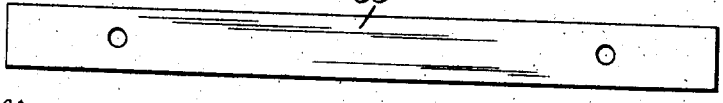


Fig. 11.



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4 SHEETS—SHEET 4.

Fig. 12.

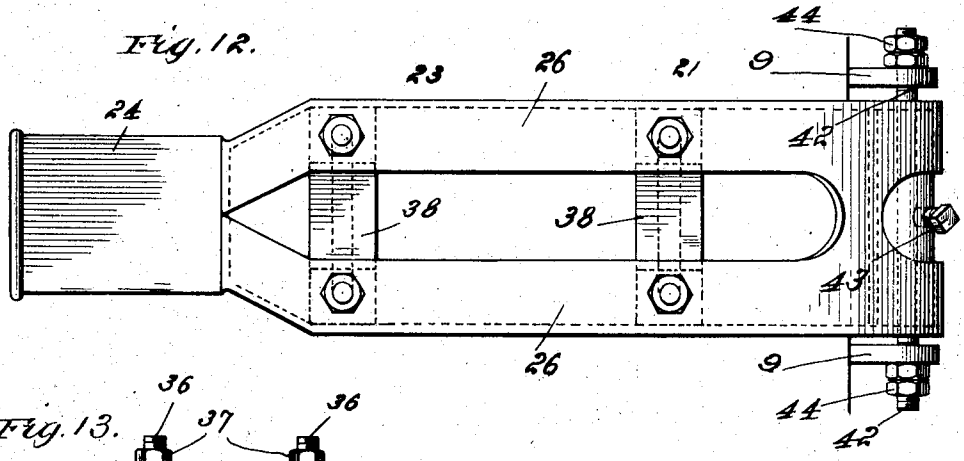


Fig. 13.

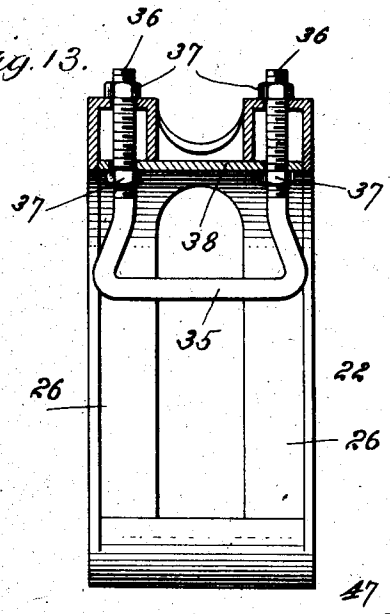


Fig. 14.

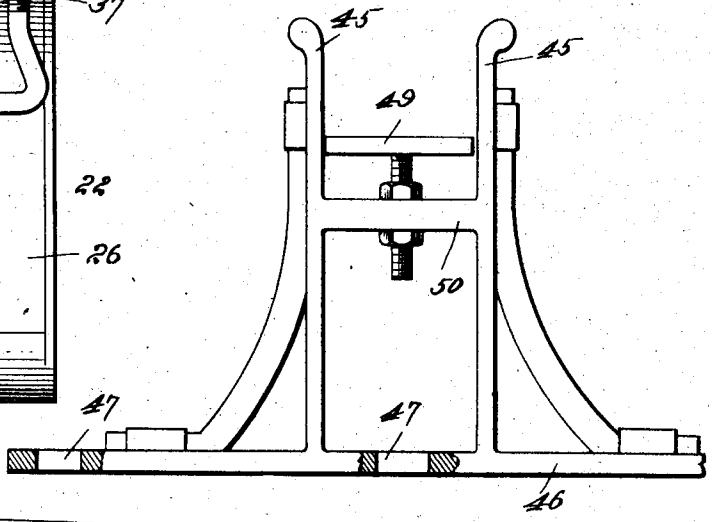


Fig. 15.

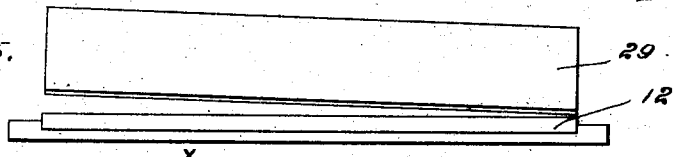


Fig. 16.

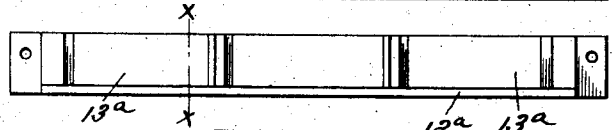
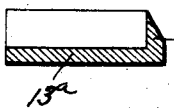


Fig. 17.



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UNITED STATES PATENT OFFICE.

DANIEL IRVING CALHOUN, OF NEW YORK, N. Y.

DOUGH-DIVIDER.

No. 834,887. Specification of Letters Patent. Patented Nov. 6, 1906.

Application filed February 25, 1905. Renewed February 21, 1906. Serial No. 302,224.

To all whom it may concern:

Be it known that I, DANIEL IRVING CALHOUN, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Dough-Dividers, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 is a perspective view of the machine; Fig. 2, a side elevation thereof; Fig. 3, a plan view of the dough-pan; Fig. 4, a transverse vertical sectional view thereof, taken on the line IV IV of Fig. 3; Fig. 5, a detail side elevation of one of the spacing-strips; Fig. 6, a side elevation of one of the pan-knives; Fig. 7, a similar view of one of the end strips of the pan; Fig. 8, a detail transverse sectional view showing the upper knives in contact with the lower or pan knives; Fig. 9, a plan view of the upper or removable cutter; Fig. 10, an end elevation thereof; Fig. 11, a plan view of one of the pressure-bars carried by the upper cutter; Fig. 12, a plan view of the handle which carries the upper cutter; Fig. 13, a transverse sectional view thereof; Fig. 14, a side elevation of the handle-guide; Fig. 15, a diagrammatic view showing the upper and lower knives; Fig. 16, a detail plan view showing one of the pan-knives formed integral with a spacing-strip, and Fig. 17 a transverse sectional view on the line X X of Fig. 16.

One of the many objects of this invention is to provide a simple, light, inexpensive, and easily-operated machine by which batches of dough may be divided into small sections for the purpose of making biscuits, rolls, and other small bakers' products.

A further object of the invention is to provide such a machine with two sets of cutting-knives, on one of which the dough is placed, and providing means for bringing the two sets of knives together in such manner that the dough is divided with a shearing or draw cut.

A further object of the invention is to provide means whereby one set of cutting-knives will work directly on the beveled cutting edges of the other knives.

Another object of the invention is to provide a removable dough-receiving pan provided with one set of cutting-knives on which the dough is to be placed and by means of which the divided portions of dough may be removed from the machine and deposited on the molding-board or other suitable place.

Other important objects and advantages of the invention will appear hereinafter.

Referring to the various parts by numerals, 1 designates the base of the machine, which is formed with the forward-projecting extension 2, adapted to prevent the base from tilting when pressure is brought on the operating-handle, as will be fully hereinafter described. This base is provided at its rear end with the transverse upstanding flange 3 and across its forward end with the two vertical parallel flanges 4, these latter flanges being spaced a suitable distance apart to form a transverse guideway 5. On one side of the base—the right-hand side, as shown in the drawings—the vertical lugs 6 are formed, said lugs projecting above the upper surface of the base and being upwardly and outwardly beveled, as shown. On the opposite side of the base—the left-hand side, as shown in the drawings—the upward-extending lugs 7 are formed, said lugs being spaced a suitable distance apart and provided with inward-extending projections 8. On the rear end of the base are formed rearward-extending lugs 9, between which the rear end of the handle, as hereinafter described, is pivoted.

The dough-receiving pan 10 is adapted to fit between the flange 3, the rearward flange 4, and the lugs 6 and 7, as shown clearly in Figs. 1 and 2. To one side of this pan—the left-hand side, as shown in the drawings—is secured a projection 11, which is adapted to fit under the projections 8 on the corresponding side of the base, as shown clearly in Fig. 2, to prevent any vertical or lateral movement of the pan at that point. The right-hand side of the pan, as shown in Fig. 1, fits closely against the lugs 6, said lugs holding the projection 11 under the projections 8. By this means it will be readily seen that the pan is centered on the base without any special adjustment by the operator.

In the dough-receiving pan are secured longitudinal parallel knives 12, whose edges are beveled, as shown clearly in Figs. 4 and 8. These knives are spaced a suitable distance apart by means of spacing-strips 13, which rest on the bottom of the pan. These strips are each formed with the transverse upward-extending ribs 14, which are spaced a suitable distance apart, the upper edges of said ribs being flush with the cutting edges of the knives, as shown clearly in Figs. 4 and 8, one end of each of said ribs abutting squarely against the straight vertical side of the ad-

joining knife and serving as a brace and support therefor. As shown in Figs. 3 and 5, these spacing-strips are formed with two ribs 14, so that each knife is braced at two points in its length. The spacing-strips are formed near each end with the enlargements 15, which are of the same height as the ribs and serve as braces for the knives at their ends. At their extreme ends recesses 16 are formed in the upper surfaces of the strips 13 to receive the end pieces 17 of the pan, corresponding recesses 18 being formed in the ends of the knives to receive said end pieces 17, these end pieces being secured in place by means of screws or other suitable fastening devices. The sides of the pan are extended above the knives and are curved outward slightly, as shown in Figs. 1 and 4, and the end pieces are formed with upward-extending outwardly-curved lugs 19, to which the upward-extending sides of the pan are secured. At one side of the pan—the right-hand side, as shown in the drawings—a handle-piece 20 is secured in order that the pan may be readily lifted from the base.

Approximately one-half of the number of the pan-knives 12 are beveled in one direction at their upper edges, the other knives being beveled in the opposite direction, as shown clearly in Fig. 4, and the knives of the upper cutter, to be hereinafter described, are so arranged as to work on the beveled surfaces of the pan-knives. It will therefore be seen that by oppositely beveling these knives, as described, the side thrust of the upper knives will be evenly distributed, and any tendency of the upper cutter to move laterally because of said thrust will be overcome and the dough cut with ease and accuracy.

The dough-receiving pan, as shown in the drawings, is adapted to receive three batches of dough—one to be placed transversely on the pan between the two lines of ribs 14 and the others to be placed between said lines of ribs and the enlargements 15. As there are eleven knives therein, said three batches of dough will be divided into twelve parts, each by the upper cutter. It will of course be understood that as many knives as desired may be arranged in the pan and that the spacing-strips may be provided with as many ribs as desired, so that the capacity of the pan may be suited for the work to be performed. The pan is made removable from the base in order that the batches of dough may be conveniently placed therein and also that it may be removed from the machine after a cutting operation and the divided dough deposited at any desired place convenient for the operator.

Pivoted between the lugs 9 at the rear of the base is the rear lower end of the handle 21. This handle consists of the rear vertical part 22 and the forward-extending horizontal part 23, this latter part being above the pan a suitable distance and lying substantially parallel with the base when in its lowered or normal position. At the forward end of the horizontal part 23 the handle is formed with a socket 24 to receive a forward-projecting wooden bar or handle part 25. The handle part 21 consists, preferably, of two parallel slightly-separated members 26, which are formed of angle-irons, said members being joined together at their forward ends to form a socket 24. Secured to the handle directly over the transverse center of the dough-receiving pan by means of a transverse bolt 27 is the upper cutter 28. This cutter consists of a series of parallel longitudinally-extending knives 29, which are spaced apart by means of blocks 30, secured between them along the upper edges thereof, said blocks spacing said knives to correspond with the spacing of the knives in the dough-pan, so that when the upper cutter is brought down to divide the dough in the pan said knives will contact with the beveled surface of the knives in the pan, as shown in Fig. 8. These knives 29 are comparatively thin and are beveled at their lower edges on both sides to bring them to a sharp cutting edge. It will of course be understood, however, that they may be beveled only on one side, if desired. As these knives are comparatively thin, they will flex slightly when pressed down on the beveled surfaces of the pan-knives. The spacing-blocks and the knives are permanently bolted together by long horizontal bolts 31, and secured to the top of the cutter midway its ends is a transverse bar 32, on which are formed upward-extending arms 33, the bolt 27 passing through the upper ends of these arms and connecting the cutter to the handle. To hold the upper cutter rigid and parallel with the horizontal part of the handle or at any angle necessary to secure the proper registration between the knives of the upper cutter and the knives of the pan, adjustable stops 34 are secured to the handle, one on each side of the bolt 27. These stops are in the form of yokes having a cross-bar 35 at their lower ends, the vertical arms 36 thereof extending through the handle part, as shown in Figs. 1 and 2. The arms of the yokes are threaded to receive the nuts 37, by means of which said yokes may be vertically adjusted. The upper nuts bear on the top of the handle part, while the lower ones bear on a cross-bar 38, which extends across the under side of the handle. By means of these nuts the cross-bars 35 of the yokes may be adjusted to bear on the top of the upper cutter and said cutter thereby maintained at the proper angle to cause its knives to register with the cutting edges of the pan-knives. It is preferred to so adjust the upper cutter that the rear ends of its knives will engage the pan-knives in advance of the other portion of the

knives, as shown in diagram in Fig. 15, in order to secure a draw or shearing cut between the two sets of knives.

To prevent the dough becoming lodged between the knives of the upper cutter, a pressure-bar 39 is mounted between each pair of said knives. Each pressure-bar is mounted on two vertical pins 40, one secured near each end thereof, said pins extending through the blocks 30 and being provided on their upper ends above said blocks with stops 41, said stops, as shown in the drawings, being nuts screwed on the upper ends of said pins. The pins 40 are of such length that when the pressure-bars are in their lowermost positions their lower surfaces are substantially flush with the lower edges of the knives of the upper cutter, as shown clearly in Fig. 10. The pins 40 are adapted to slide freely through perforations in the blocks 30, as shown clearly in dotted lines in Fig. 10, so that when the cutter is brought down on the dough said pressure-bars may rest on the dough while the knives are being forced down through it. These pressure-bars are preferably made of metal to give them sufficient weight to exert a slight equalizing-pressure on the dough, so that the batch of dough will be practically brought to the same level by said pressure-bars, whereby all the divisions of the dough will practically be of an equal size. When the cutter is raised, these pressure-bars force the sections of dough from between the knives. This is important, and it will of course be readily understood that these pressure-bars may be made in any suitable manner.

To provide for the lateral adjustment of the upper cutter to secure the proper register between its knives and the pan-knives, I mount the handle carrying said upper cutter on the pivot-bolt 42, said handle being rigidly secured to said bolt by means of a set-screw 43, as shown clearly in Fig. 12. The ends of the pivot-bolt 42 are threaded, and screwed thereon are lock-nuts 44, by means of which said pivot-bolt may be adjusted laterally in the lugs 9. By this means the handle and the upper cutter may be adjusted laterally in either direction. To properly center the upper cutter, a guide 45 is mounted on a transverse bar 46, which is adapted to fit in the channel or guideway 5, formed by the transverse flanges 4 at the forward end of the base. This bar 46 is formed with slots 47, through which bolts 48 extend to adjustably secure said bar to the base and so that the guide may be shifted laterally to place it in proper position to receive the socket part 24 of the handle, and thereby center the cutter over the pan. To prevent the cutter-knives from being forced too far down on the pan-knives, a vertically-adjustable stop 49 is mounted in the cross-bar 50 of the guide 45. By vertically adjusting this stop the cutter-knives may be lowered to compensate for wear and arrested at the proper point to avoid all danger of injury to said knives and to the pan-knivers.

In Figs. 16 and 17 a spacing-strip 13^a is shown as formed integral with one of the pan-knives 12^a. This is an obvious arrangement which has some advantages over the arrangement shown in Fig. 4, wherein the knives and spacing-strips are separate.

From the foregoing it will be readily seen that I provide an exceedingly simple, light, and easily-operated dough-divider by means of which batches of dough may be divided into small pieces suitable for making rolls and the like with very little pressure. This latter feature is of great importance. It has been found that to subject dough to a heavy pressure when the dough is in the proper condition for baking destroys its life, so that when baked it is heavy and has lost its lightness and fine quality. Because of this fact bakers have refused to use dough-dividers which require a heavy pressure to force the cutting-knives through the dough. The dough is not divided until it is in a condition to be baked, and at that point in its manipulation it is very sensitive to pressure. For this reason a dough-divider operating under a very light pressure is essential.

Having thus described my invention, what I claim is—

1. A dough-divider comprising two sets of knives, the knives of one set being beveled on their cutting edges, means for moving one of said sets of knives whereby the cutting edges of one set of knives will be brought into engagement with the beveled surface of the other set of knives, one set of said knives being adapted to yield laterally slightly in order that their cutting edges will move slightly downward and outward along the beveled surface of the other set of knives.

2. A dough-divider comprising two sets of knives, the knives of one set being thicker than the knives of the other set, the thicker knives being beveled on their cutting edges, and means for bringing the cutting edges of the thinner knives into engagement with the beveled surfaces of the thicker knives, the thinner set of knives being adapted to have a slight lateral or outward movement, whereby they may be moved slightly downward and outward on the beveled cutting edges of the thicker knives.

3. A dough-divider comprising two sets of knives, one of said sets of knives being thicker than the other set and beveled on their cutting edges, said thicker set of cutting-knives being held stationary during the cutting operation the set of thinner knives being slightly flexible, means for bringing the cutting edges of the thinner knives into engagement with the beveled surfaces of the thinner stationary knives, whereby the thinner knives will yield

or flex slightly and have a slight downward movement on the beveled surfaces of the thicker knives.

4. A dough-divider comprising a set of stationary knives beveled along their upper edges, some of said knives being beveled in one direction and the others being beveled in the opposite direction, and a series of movable slightly-flexible knives adapted to engage the beveled surfaces of the stationary knives to be slightly flexed thereby.

5. A dough-divider comprising a dough-receiving pan, a frame to receive and center said pan, a series of parallel knives within said pan, a number of said knives being beveled in one direction and the other being beveled in the opposite direction, a handle pivoted on the frame, a cutter carried by said handle and formed of a series of parallel slightly-flexible knives adapted to engage the beveled surfaces of the pan-knives and to be slightly flexed thereby.

6. A dough-divider comprising a dough-pan, a series of knives therein beveled on their upper cutting edges, a movable cutter carrying a series of knives adapted to engage the beveled upper edges of the knives in the dough-pan, said knives in the movable cutter being adapted to yield laterally slightly, whereby they may be moved downward and outward on the beveled cutting edges of the knives in the dough-pan.

7. A dough-divider comprising a base, a dough-pan adapted to be placed thereon, a series of parallel knives in said pan, a pivoted handle, a cutter carried by said handle and provided with a series of parallel thin cutting-knives adapted to register with the knives in the dough-pan, said knives being adapted to be flexed slightly whereby they may be moved over the beveled edges of the pan-knives.

8. A dough-divider comprising a base, a dough-pan adapted to be removably secured thereon and provided with a series of parallel knives, a handle pivoted to the base, a cutter carried by said handle, means carried by said handle for adjusting said cutter to cause the knives thereof to register with the knives in the dough-pan, and an adjustable guide carried by the base and adapted to receive the handle.

9. A dough-pan for a dough-divider comprising a receptacle, a series of parallel knives therein, a series of spacing-strips between said knives, and upward-extending transverse ribs formed on said spacing-strips at coincident points equal in height to the knives, whereby transverse divisions will be formed in said dough-pan.

10. A dough-divider comprising a set of stationary knives beveled along their upper edges, a portion of said knives being beveled in one direction and a portion being beveled in the opposite direction, and a series of movable knives adapted to engage the beveled edges of the stationary knives.

11. A dough-divider comprising a base, a dough-pan provided with a series of parallel knives, a handle pivoted to the base, a cutter adjustably mounted on the handle, adjustable stops carried by the handle in front and in the rear of the cutter-pivot, whereby the said cutter may be adjusted at its front or rear edge toward or from the knives in the dough-pan to place said knives at any desired angle with respect to the pan-knives, to secure a draw cut between said knives.

12. A dough-divider comprising a base, a series of parallel knives thereon, a handle pivoted to the base on a transverse pivot, a cutter adjustably mounted on the handle on a transverse pivot, adjustable stops carried by the handle in the front and rear of the cutter-pivot, whereby the said cutter may be adjusted at its front and rear edge to place the knives at any desired angle with respect to the pan-knives.

13. A dough-divider comprising a base, a dough-pan provided with a series of parallel knives, a pivoted handle, a cutter carried by said handle, a guide carried by the base and adapted to receive the handle, means for laterally adjusting said guide and a vertically-adjustable stop carried by said guide and adapted to arrest the handle at the proper point, and to be adjusted to compensate for the wear on the knives and to secure the proper registration thereof.

14. A dough-divider comprising a dough-receiving pan, a frame to receive and center said pan, a series of parallel knives within said pan, a number of said knives being beveled in one direction and the others being beveled in the opposite direction, a handle pivoted on the frame, a cutter carried by said handle and formed of a series of parallel slightly-flexible knives adapted to engage the beveled surfaces of the pan-knives and to be slightly flexed thereby, and means for laterally adjusting the movable cutter to bring the cutting edges of said cutter into proper registration with the beveled surfaces of the pan-knives.

15. A dough-divider comprising a dough-receiving pan, a frame to receive and center said pan, a series of parallel knives within said pan, a number of said knives being beveled in one direction and the others being beveled in the opposite direction, a handle pivoted on the frame, a cutter carried by said handle and formed of a series of parallel slightly-flexible knives adapted to engage the beveled surfaces of the pan-knives and to be slightly flexed thereby, and means on the base at the rear of the dough-receiving pan for adjusting the handle laterally, and an adjustable guide on the base in front of the dough-receiving pan and adapted to receive the handle, whereby the knives of

the movable cutter may be accurately adjusted to engage the beveled surfaces of the pan-knives.

16. A dough-divider comprising a dough-receiving pan, a frame to receive and center said pan, a series of parallel knives within said pan, a number of said knives being beveled in one direction and the others being beveled in the opposite direction, a handle pivoted on the frame, a cutter carried by said handle and formed of a series of parallel slightly-flexible knives adapted to engage the beveled surface of the pan-knives and to be slightly flexed thereby, and means carried by the handle for adjusting the cutter whereby the longitudinal edges of the knives may be arranged at any desired angle with respect to the cutting edges of the pan-knives.

17. A dough-divider comprising a base, a removable dough-receiving pan, means on the base for centering the dough-receiving pan thereon, a series of parallel comparatively thick knives in said pan, said knives being beveled on their upper edges, a handle pivoted on said base at the rear of the dough-receiving pan, means for laterally adjusting said handle at the pivotal point, a cutter carried by said handle and formed of a series of parallel, slightly-flexible knives adapted to be brought into engagement with the beveled surfaces of the pan-knives and to be slightly flexed thereby, a laterally-adjustable guide mounted on the base in front of the dough-pan and adapted to receive the handle, means carried by the handle for adjusting the cutter to vary the angle of the longitudinal edges of the knives with respect to the cutting edges of the pan-knives, and a stop carried by the handle-guide to limit the downward movement of the handle.

18. A dough-divider comprising a dough-receiving pan, a series of parallel cutters therein, a vertically-movable cutter formed with a series of parallel knives adapted to register with the cutting edges of the pan-knives, freely-movable presser-bars arranged between the knives of the vertically-movable cutter and adapted to force the dough from between said knives when the cutter is raised after a cutting operation.

19. A dough-divider comprising a base, a dough-receiving pan provided with a series of parallel knives on which the dough is to be placed, a handle pivoted on said base, a cutter mounted on said handle and formed of a series of parallel knives whose cutting edges are adapted to register with the cutting edges of the pan-knives, a series of heavy presser-bars mounted between the knives carried by the handle, guide-rods connected to said presser-bars and adapted to move freely in the cutter, whereby when the handle is raised the presser-bars will force the dough from between the knives.

20. A dough-pan formed of an outer case, a series of parallel knives arranged therein, a series of spacing-bars arranged between said knives, said spacing-bars being formed at corresponding points with transverse ribs which brace the knives and form transverse division-ribs across the pan, whereby the interior of the pan is divided into a plurality of transverse compartments.

21. A dough-pan formed of an outer case, a series of parallel knives arranged therein, a series of spacing-bars arranged between said knives, said spacing-bars being formed at corresponding points with transverse ribs which brace the knives and form transverse division-ribs across the pan, whereby the interior of the pan is divided into a plurality of transverse compartments, and retaining-strips at the ends of the pan to secure the knives and the spacing-bars in position.

22. A dough-pan formed of an outer case, a series of parallel knives arranged therein, some of said knives being beveled in the opposite direction, a series of spacing-bars arranged between said knives, said spacing-bars being formed at corresponding points with transverse ribs which brace the knives and form transverse division-ribs across the pan, whereby the interior of the pan is divided into a plurality of transverse compartments.

23. A dough-divider comprising a base, a dough-pan movably mounted thereon, means on the base to center the dough-pan, a series of parallel knives rigidly supported in and movable with the dough-pan, a handle, means for pivotally mounting said handle on the base, a vertically-adjustable stop for said handle, a series of parallel knives carried by said handle and adapted to register with the knives in the dough-pan whereby the dough-pan may be removed from the base after each cutting operation and the contents thereof readily removed.

24. A dough-divider comprising a base, a removable dough-pan loosely mounted thereon, means on the base to center the dough-pan, a series of parallel knives mounted in the dough-pan and movable therewith, said knives being beveled on their cutting edges, a pivoted handle mounted on the base, a cutter carried by said handle, said cutter consisting of a series of parallel slightly-flexible knives, sharpened on their cutting edges and adapted to contact with the beveled surfaces of the knives in the dough-pan, means to center the movable cutter over the dough-pan, and means to limit the downward movement of the handle.

25. A dough-divider comprising a base, a dough-pan removably mounted thereon, means to center the dough-pan on the base, a series of parallel knives permanently secured within the dough-pan, a cutter provided with a series of parallel knives adapted to register with the knives in the dough-pan,

whereby the dough-pan may be removed from the base and the contents thereof readily removed.

26. A dough-divider comprising two sets of knives, the knives of one set being beveled on their cutting edges, means for moving one of said sets of knives to bring their cutting edges into engagement with the beveled surfaces of the knives of the other set, one of said sets of knives being adapted to yield laterally when the two sets of knives are brought into forcible engagement.

27. A dough-divider comprising two sets of knives, the knives of one set being beveled on their cutting edges, means for moving one set of knives to bring the two sets of knives into engagement, said knives being so located with respect to each other that when they are in engagement the cutting edges of the knives of one set will contact with the beveled surfaces of the other set of knives whereby the cutting edges of the knives will pass each other during the cutting operation.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 24th day of February, 1905.

DANIEL IRVING CALHOUN.

Witnesses:

WM. R. DAVIS,

E. M. DAVIS.