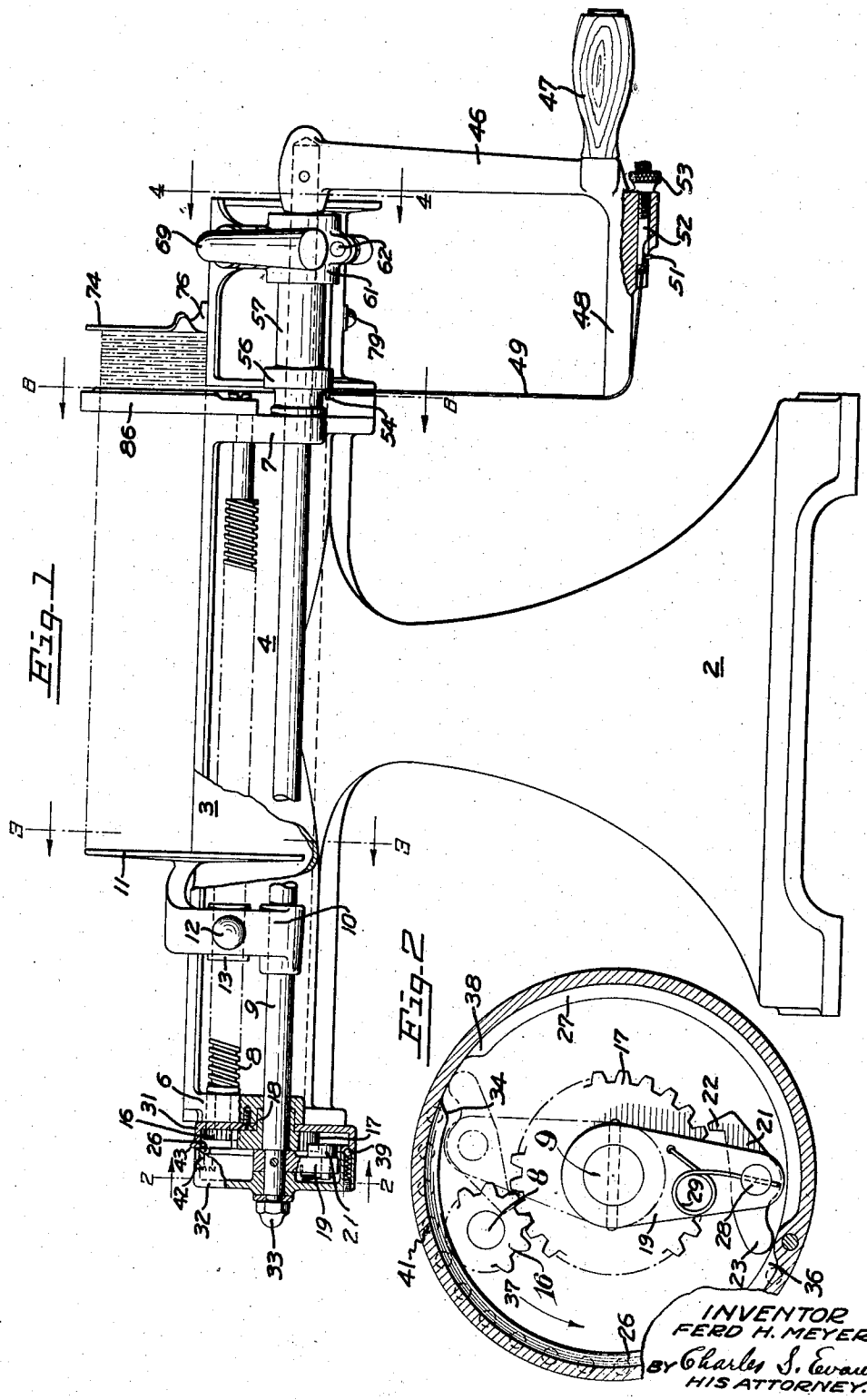
Oct. 13, 1931. F. H. MEYER 1,827,251

SLICING MACHINE

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SLICING MACHINE

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Fig. 5

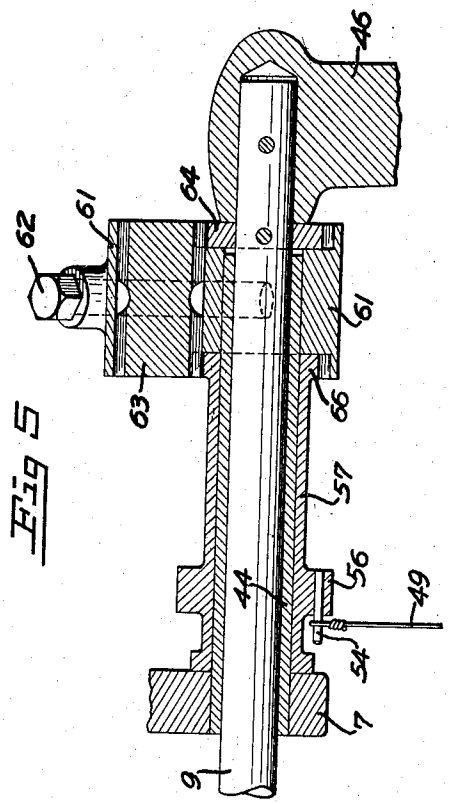


Fig. 7

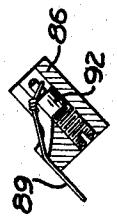


Fig. 6

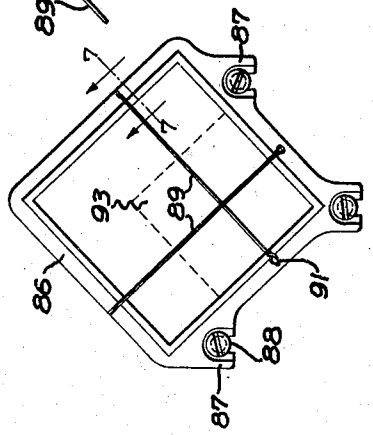


Fig. 3

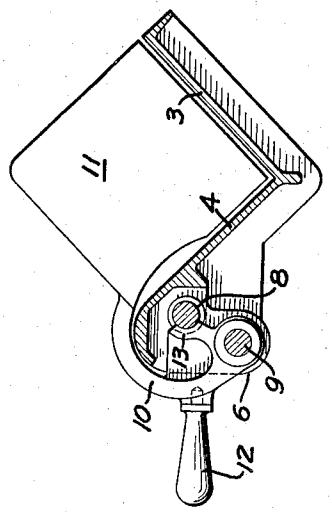
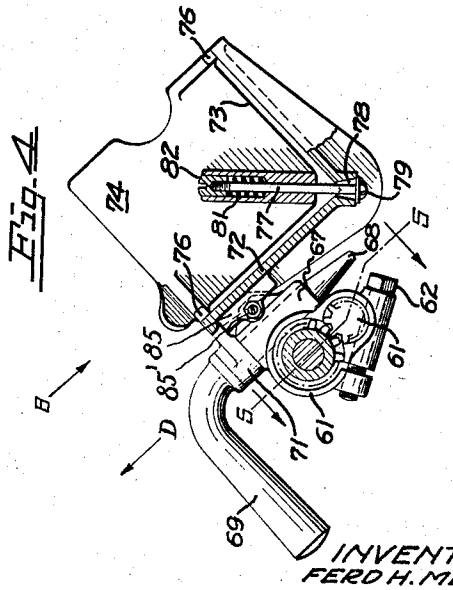


Fig. 4



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SLICING MACHINE

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Fig. 9

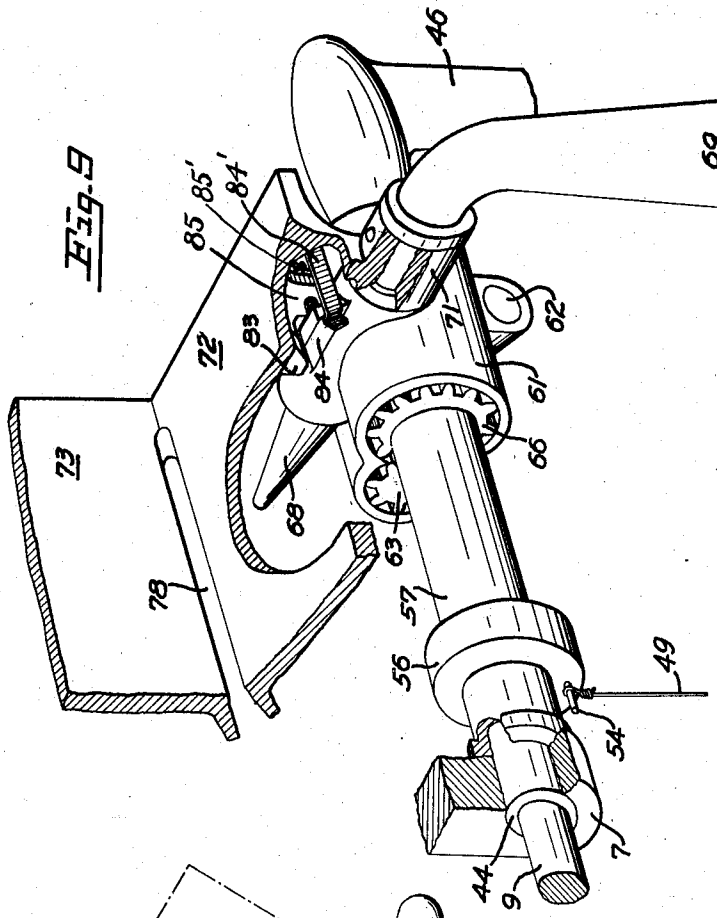


Fig. 8

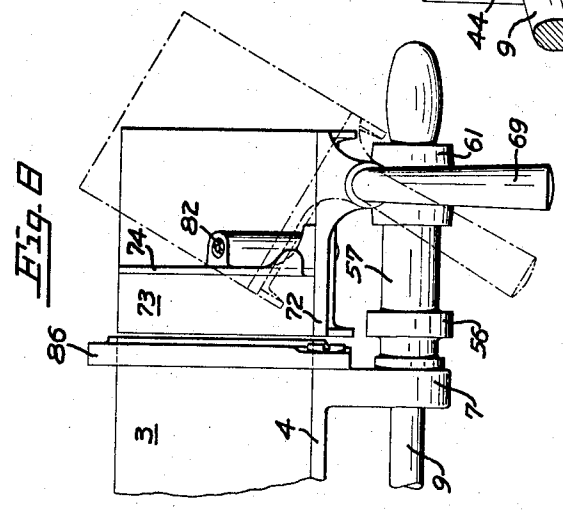
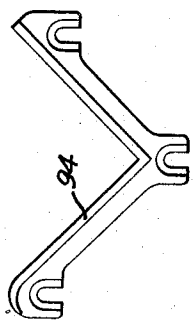


Fig. 10



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Patented Oct. 13, 1931 1,827,251

UNITED STATES PATENT OFFICE

FERD H. MEYER, OF OAKLAND, CALIFORNIA, ASSIGNOR OF ONE-HALF TO GEORGE H. ROBERTS AND ONE-HALF TO JOSEPH SCHOR, BOTH OF SAN FRANCISCO, CALIFORNIA

SLICING MACHINE

Application filed September 28, 1926. Serial No. 138,146.

My invention relates to slicing machines and particularly to devices for cutting cheese or butter into slices.

One of the objects of the invention is the provision of a slicing machine in which is incorporated improved means for collecting and holding the slices.

Another object of the invention is the provision of a slicing machine in which improved means are provided for adjusting the thickness of the slice.

Another object of the invention is the provision of a slicing machine comprising a simple, sturdy mechanism which lends itself readily to factory production at a reasonable cost.

Other objects of the invention, together with the foregoing, will be set forth in the following description of the preferred embodiment of means for practicing the invention and which is illustrated in the drawings accompanying and forming part of the specification. It is to be understood that I do not limit myself to the showing made by said description and drawings, as I may adopt variations of my preferred form within the scope of my invention as set forth in the claims.

In the drawings:

Figure 1 is a side elevation of my slicing machine, portions being shown in section to disclose the construction.

Figures 2, 3 and 4 are vertical sectional views, the respective planes of section being indicated by the lines 2—2, 3—3, and 4—4 of Figure 1.

Figure 5 is a sectional view showing the construction of the stacker bracket. The plane in which the view is taken is indicated by the line 5—5 of Figure 4.

Figure 6 is a vertical sectional view showing in elevation the subdividing means utilized in cutting butter. The plane of section is indicated by the line 6—6 of Figure 1.

Figure 7 is a detail in section showing the means for tensioning the cutting wires of the subdividing means shown in Figure 6. The plane in which the section is taken is indicated by the line 7—7 of Figure 6.

Figure 8 is a view of one end of the slicing machine, the direction from which the view is taken being indicated by the arrow 8 of Figure 4.

Figure 9 is a perspective view, partly in section, showing the stacker on its bracket at the crank end of the machine.

Figure 10 is an elevation of the filler block 94.

In terms of broad inclusion the slicing machine of my invention comprises a suitably formed pedestal carrying a support or trough adapted to receive the loaf or bar of cheese or butter or other material which is to be sliced. Extending longitudinally of the trough is a shaft having a crank at one end, with which it may be rotated; and a pusher pivotally mounted on this shaft is arranged to be fed forwardly in the trough by means of a feed screw with which it is engaged when in the trough.

Means are provided for connecting the feed screw for rotation with the shaft thru a portion of a complete revolution of the shaft, so that with every revolution of the shaft, the feed screw is connected for rotation therewith part of the time, and the rest of the time is at rest. The rest period is of course while the slice is being cut; and means are provided for varying the length or degree of arc of movement of the shaft during which the rotatable connection with the feed screw is made, so as to vary the amount of movement of the pusher and consequently the thickness of the slice. Means are also provided which move across one end of the trough to cut the slice as the loaf or bar of material is fed forwardly by the pusher; and a slice-receiving means or stacker is provided in continuation of the trough on which the slices accumulate as fast as they are formed. This stacker is provided with a handle and is readily detachable, so that an accumulation of slices may be lifted from the machine and taken to the point of use without separate handling.

In greater detail the slicing machine of my invention comprises a base or pedestal 2 of any desired shape adapted to provide a secure support, and preferably integrally formed with an upwardly opening trough comprising the two sides 3 and 4 disposed at slightly

less than a right angle to each other, and long enough to receive the largest loaf or bar which it is desired to slice. At each end of the trough the side 4 is provided with heavy flanges 6 and 7, in which are journaled the feed screw 8, and the drive shaft 9.

Slidably and pivotally mounted on the shaft 9, is an arm 10, on the end of which is formed a pusher or plate 11, adapted to lie in the trough, as best shown in Figure 3, or to be swung backwardly out of the trough by the handle 12. The arm 10 is also provided with a fractional nut 13, adapted to engage the feed screw 8 when the pusher is in the trough, and to be disengaged from the feed screw, when the pusher is swung out of the trough. When the nut 13 is disengaged from the feed screw, the pusher may be moved back and forth on the shaft to position it against the end of the loaf or bar which is to be sliced.

Means are provided for connecting the feed screw for rotation with the shaft during the desired arc of movement of the latter. During such connection, the pusher is of course being moved by the feed screw. When not so connected the pusher is at rest. The parts are so arranged that the period of rest corresponds to that period during which the slicing means is passing thru the material.

Fixed on the feed screw is a gear 16, in mesh with the wider gear 17, journaled on the shaft 9. Preferably also, the gear 17 is provided with a hub 18 bearing in the flange 6, and in which hub the shaft 9 is also journaled.

Fixed on the end of the shaft is the arm 19, carrying the pivotally mounted dog 21, having at one end a tooth 22 adapted to engage in the teeth of the gear 17, and at the other end having a tail 23, adapted to engage the cams 26 and 27. The dog is fixed rigidly on the pivot pin 28, journaled in the arm 19; and a spring 29 interposed between the arm and the pin presses the dog resiliently against the cams. The cam 26 is formed as a flange on the casing 31, fixed by any suitable means on the flange 6, and surrounding the gears 16 and 17. The cam 27 is formed as a flange on the movable casing 32, journaled on the end of the shaft 9, and retained thereon by the nut 33. It will be observed from Figure 2, that cams 26 and 27 are each slightly less than 180 degrees in extent; and from Figure 1 it will be noted that the two cams lie side by side. When the tail of the dog is riding upon either of the cams, the tooth 22 is out of engagement with the gear 17 and the feed screw and pusher are at rest. The end 34 of the fixed cam is so positioned that the dog engages it just prior to the entrance of the cutting device into the material in the trough. This lifts the tooth 22 out of the gear 17, and insures the fixed position of the pusher and material during the cutting operation. The other end 36 of the fixed cam is so positioned that the feeding of the pusher, by reason of the engagement of the tooth 22 with the gear 17, cannot begin until after the slicing operation has been completed.

The casing carrying the cam 27 is rotatable about the axis of the shaft, to position the cam 27 relative to the cam 26. When the cams are side by side over their whole length, the dog tail 23 engages and disengages both cams at the same time. In this adjustment the maximum amount of feed for the pusher is secured, since the tooth 22 is then in engagement with the gear 17, while the tail of the dog is traveling in the arc between the end 36 of the fixed cam and the beginning 34 of the fixed cam.

By rotating the casing 32 in the direction of the arrow 37, Figure 2, the end 38 of the adjustable cam may be positioned at any point between the end 36 and the beginning 34 of the fixed cam; so that after leaving the fixed cam, the dog continues in raised position on the adjustable cam, and the tooth 22 is not permitted to engage the gear 17 until the dog leaves the end 38 of the adjustable cam. In the position of the two cams shown in Figure 2, the maximum extension of the cam is shown; the tail of the dog being out of engagement with the cam and the tooth 22 in engagement with the gear 17 for only a short arc of movement of the shaft. This represents the shortest possible feed for the pusher. I have found it desirable to so proportion the parts that this minimum is about one fiftieth of an inch; that is to say, with this setting a slice one fiftieth of an inch thick will be cut.

A spring pressed ball 39 is interposed between the casing 32 and the fixed casing 31, and recesses 41 in the fixed casing 31 provide the seat in which the ball is resiliently caught when the casing 32 is rotated. Graduations 42 on the casing 32 are arranged in correspondence with the seats 41, so that the particular seat in which the ball is lodged, corresponding to the setting of the cam end 38, is evaluated by the graduation. These graduations are conveniently numbered consecutively, beginning at "1"; and are registered as desired with a fixed mark or point 43 on the fixed housing 31. The increments represented by the graduations are preferably about 1/50 of an inch; and in the substantially 180 degrees of movement of the cam, I find it quite possible to provide for cutting slices varying by this small amount from the thinnest up to nearly one-half inch.

At the opposite end of the trough from the feed mechanism is arranged the cutting or slicing device, and the crank with which the machine is operated. As best shown in Figure 5, the shaft 9 extends thru a tubular bracket 44, rigidly mounted in the flange 7, projecting downwardly from the side of the trough. Fixed on the end of the shaft is the arm 46, provided with a crank handle 47,

with which the shaft may be turned. The crank arm 46 is also provided with the bracket arm 48, over the curved end of which the cutting wire 49 is drawn. One end of the wire 49 is caught around a pin 51, held in the threaded pin 52, adjustably positioned in the arm 48 by the knurled nut 53. The other end of the cutting wire 49 is caught around a pin 54, fixed in the flange 56, formed on the sleeve 57, which is journaled on the bracket 44. It will be noted from an inspection of Figure 1, that the cutting wire 49 is spaced a considerable distance from the arm 46, and this is done so as to permit the placing of a stacker or slice receiving means at the end of the trough.

Since the cutting wire 49 makes a complete revolution around the shaft 9, and also past the end of the trough, means are provided for supporting the stacker from the fixed bracket 44. A head or block 61 is clamped about the end of the bracket 44 by means of a screw 62. The same screw is utilized to retain, in a bore in the head, a cylindrical gear 63, which is formed with an annular groove around its central portion, in which the screw 62 engages. A gear 64 fixed to the shaft on one side of the head 61, and a gear 66 on the other side and formed on the sleeve 57, are both in mesh with the gear 63. These gears provide means for transmitting the motion of the crank and shaft to the sleeve 57, so that it moves as one with the shaft and crank arm. Thus the cutting wire 49 is driven both at its inner and its outer ends.

Formed in the head 61, is a socket in which a pin 67, having the pointed end 68 to facilitate its engagement in the socket, may be readily engaged. The pin terminates in a handle 69, to which is also rigidly attached by means of the lug 71, the slice stacker, comprising a short trough formed with the sides 72 and 73. When the stacker is in the machine shown in Figure 1, it forms an extension of the trough; and as the slices are formed they are received on the stacker against the retaining plate 74, Figure 4, having the feet 76 resting against the walls of the stacker, and being resiliently but loosely held by the rod 77, projecting downwardly from the retaining plate thru a slot 78 in the bottom of the stacker. The end of the rod is provided with a head 79, bearing on the bottom of the stacker, and a spring 81 interposed between the rod and the plate, and adjusted by the nut 82, resiliently holds the plate against the walls of the stacker and at the same time permits the plate to be forced along as the slices are formed. Sometimes the end of the bar or loaf is not quite square, and this mounting of the retaining plate in the stacker permits it to accommodate itself to the first slice cut.

While the slices are being cut, the retaining plate is forced gradually back, until the desired quantity has been accumulated in the stacker, at which time it is desirable to detach the stacker from the machine in order to avoid the separate handling of the slices. This is accomplished by grasping the handle 69 and tipping up the stacker as shown in Figure 8 in dotted lines. This movement not only swings the stacker up so that the slices are held as in a receptacle, but disengages a lug 83 on the under side of the wall 72, Figure 9, from a lug 84 formed on top of the head 61. A pulling movement on the handle 69, that is, in the direction of the arrow D, Figure 4, then unseats the pin 67 and the entire stacker may be lifted free of the machine, so that it can be carried as a receptacle for the slices to the point at which the slices are to be used. It will be noted that the adjacent ends of the lugs 83 and 84 are sloping so as to force the tipping of the stacker in case an effort is made to lift it from the machine without first turning the handle. When the handle 69 is pulled outwardly without turning it, the lug 83 on the stacker is pulled toward lug 84. Therefore lug 83 will ride onto lug 84, due to the slope at their ends. As this occurs, the stacker will turn, and hence the operator will necessarily complete the turning in order to completely disengage the lugs. Of course the tipping of the stacker is desirable to prevent the slices falling from it when it is freed from the machine, and to separate the last slice from the uncut portion.

In order to overcome any tendency of the stacker to be tipped upwardly by the pressure of the slices against the retaining plate, I have fixed a spring 84′, on the under side of the stacker wall 72, in such position as to resiliently engage the end of the lug 84. This offers resistance sufficient to keep the stacker in proper position while the slices are being cut, and yet permits the tipping and disengagement of the stacker by the handle 69. For preventing tipping of the frame in a direction toward wire 49, the under side of wall 72 is also provided with a stud 85 in which is threaded the set screw 85′ which is adapted to engage lug 84.

Since it is usually desirable to subdivide the slices when a brick or bar of butter is cut up, I provide a subdividing means thru which the butter is forced immediately prior to the formation of the slice. This subdividing means comprises a frame 86, as shown in Figure 6, provided on the two lower sides with the yokes 87, constituting sockets adapted to be fitted over threaded pins 88 fixed in the end flanges of the trough. Figure 1 shows the slicing machine with the subdividing frame in position; and it will be noted that the path thru which the cutting wire 49 turns, is immediately in front of the frame. Stretched tightly across the frame 86 are two wires 89, at right angles to each other and held taut by any suitable means. Preferably

one end of each wire is looped about a pin 91, fixed in the frame, and the other end of the wire is looped about a pin 92, threaded into the opposite side of the frame, so that it may be adjusted to place the proper tension on the wire. These wires are so placed that a bar of butter, indicated by the dotted lines 93 in Figure 6, will be divided into four equal prisms as it is forced past the wires 89 by the advancing pusher 11. The wire 49 cuts transversely across the four pieces with each revolution of the crank, and leaves the four slices of butter in position on the stacker. Preferably, however, the stacker is removed in the slicing of butter and the pieces permitted to fall into a pan of ice water. When cheese is to be sliced, the whole slice is usually desired and therefore the frame 86 is lifted out of position, and a filler block 94 inserted in its place. The filler block is merely to bridge the space otherwise occupied by the subdivider, and is substantially similar to the two lower sides of the subdividing frame, as shown in Figure 10.

I claim:

1. A slicing machine comprising a support for the material to be sliced, a shaft journaled in said support, an arm fixed on said shaft, a crank handle on said arm for turning the shaft, a cutting element spaced from the arm and connected therewith for rotation across the end of said support, and a slice stacker alined with the support and demountably arranged between the cutting element and the arm.

2. A slicing machine comprising a support for the material to be sliced, a shaft journaled in said support, an arm fixed on said shaft, a crank handle on said arm for turning the shaft, a cutting element spaced from the arm and connected therewith for rotation across the end of said support, a slice stacker alined with the support and demountably arranged between the cutting element and the arm, and a pusher actuated by said shaft for advancing the material in the support past the cutting element onto the slice stacker.

3. A slicing machine comprising a support for the material to be sliced, a shaft journaled in said support, an arm fixed on said shaft, a cutting element spaced from the arm and connected therewith for rotation across the end of said support, a bracket having a socket therein and fixed between the cutting element and the arm, a slice stacker, and a stud on the stacker demountably arranged in said socket.

4. A slicing machine comprising a support for the material to be sliced, a shaft journaled in said support, an arm fixed on said shaft, a cutting element spaced from the arm and connected therewith for rotation across the end of said support, a bracket having a socket therein and fixed between the cutting element and the arm, a slice stacker, a stud on the stacker demountably arranged in said socket, and means interposed between the stacker and bracket for turning the stacker and stud prior to its release from the bracket.

5. A slicing machine comprising a support for the material to be sliced, a shaft journaled in said support, an arm fixed on said shaft, a cutting element spaced from the arm and connected therewith for rotation across the end of said support, a bracket having a socket therein and fixed between the cuttting element and the arm, a slice stacker, a stud on the stacker demountably arranged in said socket, and a handle arranged on the stud.

6. A slicing machine comprising a trough for holding the material to be sliced, a shaft journaled on said trough, an arm mounted on said shaft, a cutting element spaced from the arm and connected therewith for rotation across the end of said trough, a pusher actuated by the shaft for advancing the material in the trough to the cutting element, a stacker bracket fixed between the cutting element and the arm, a slice stacker comprising a short trough demountably held on said bracket, and means interposed between the stacker and bracket for enforcing an upward movement of the receiving end of the stacker prior to its release from the bracket.

7. A slicing machine comprising a trough for holding the material to be sliced, a tubular bracket extending from the trough, a shaft journaled in the bracket, a head fixed on the bracket, a sleeve journaled on the bracket between the head and trough, an arm fixed on the shaft, slicing means carried by the sleeve and arm, means disposed in said head for connecting the sleeve and shaft for rotation together, and a slice stacker mounted on said head.

8. A slicing machine comprising a support for the material to be sliced and having a trough, a bracket extending from the trough, a drive shaft journaled in said bracket, means for turning the shaft, a sleeve journaled on the bracket, a slice stacker mounted on the bracket, an arm fixed on said shaft, a cutting element carried by the sleeve and arm and arranged to move between the support and the slice stacker, and means arranged on said bracket for rotating said sleeve equally with the shaft.

9. A slicing machine comprising a support for the material to be sliced and having a trough, a bracket extending from the trough, a drive shaft journaled in said bracket, means for turning the shaft, a sleeve journaled on the bracket, a slice stacker mounted on the bracket, an arm fixed on said shaft, a cutting element carried by the sleeve and arm and arranged to move between the support and the slice stacker, a cylinder gear, means for journaling said gear, and gears

on the shaft and sleeve in mesh with the cylinder gear.

10. A slicing machine comprising a support for the material to be sliced and having a trough, a bracket extending from the trough, a drive shaft journaled in said bracket, means for turning the shaft, a sleeve journaled on the bracket, a head fixed on the bracket and having a bore therein parallel to the shaft, a slice stacker mounted on the head, an arm fixed on said shaft, a cutting element carried by the sleeve and arm and arranged to move between the support and the slice stacker, gears of the same size fixed on sleeve and shaft on each side of said head, and a cylinder gear in said bore and in mesh with the sleeve and shaft gears.

In testimony whereof, I have hereunto set my hand.

FERD H. MEYER.