April 28, 1936. C. L. STRAETEN 2,038,770

SLICING MACHINE

Filed Sept. 29, 1932 4 Sheets-Sheet 1

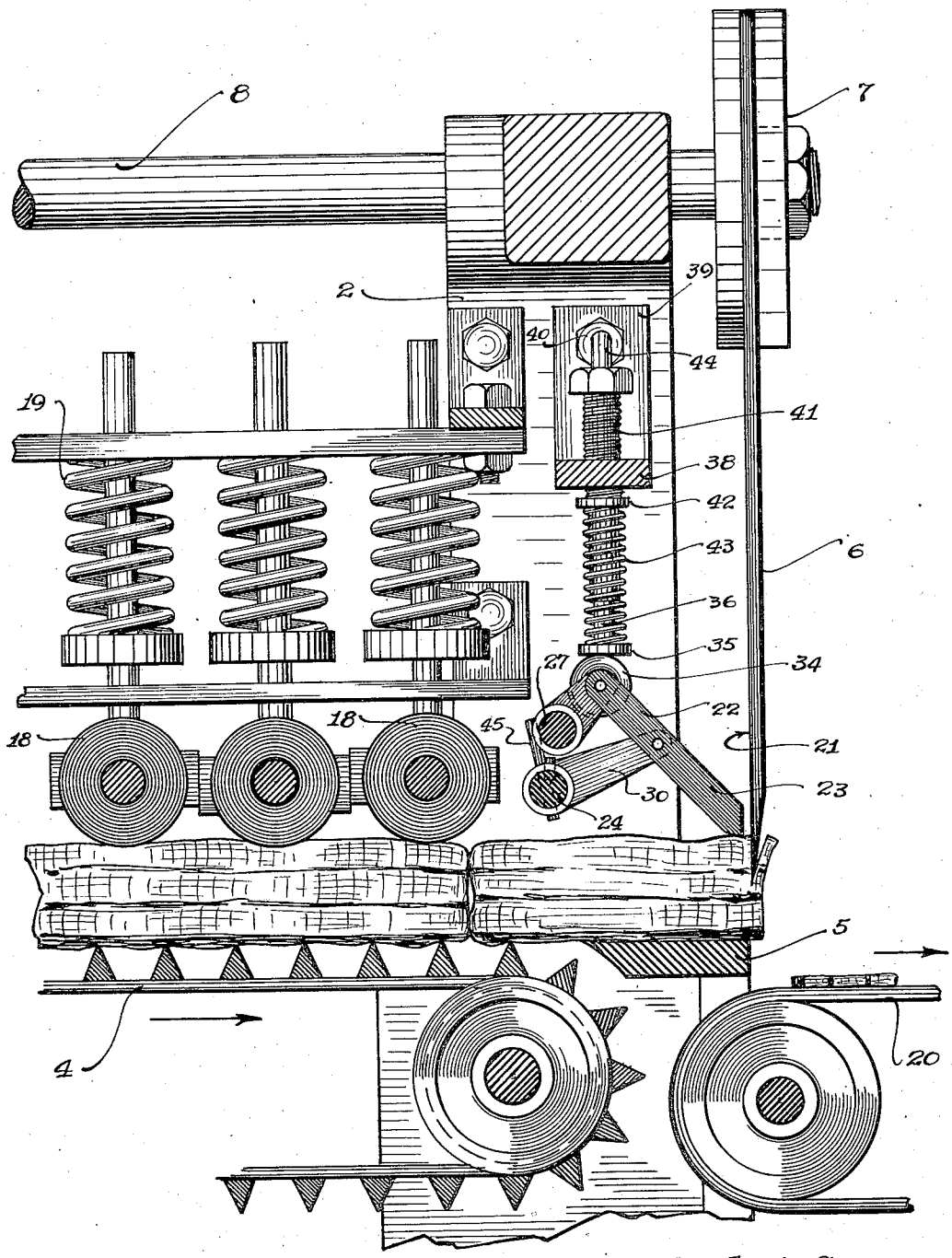


Fig. 1

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SLICING MACHINE

Filed Sept. 29, 1932 4 Sheets-Sheet 2

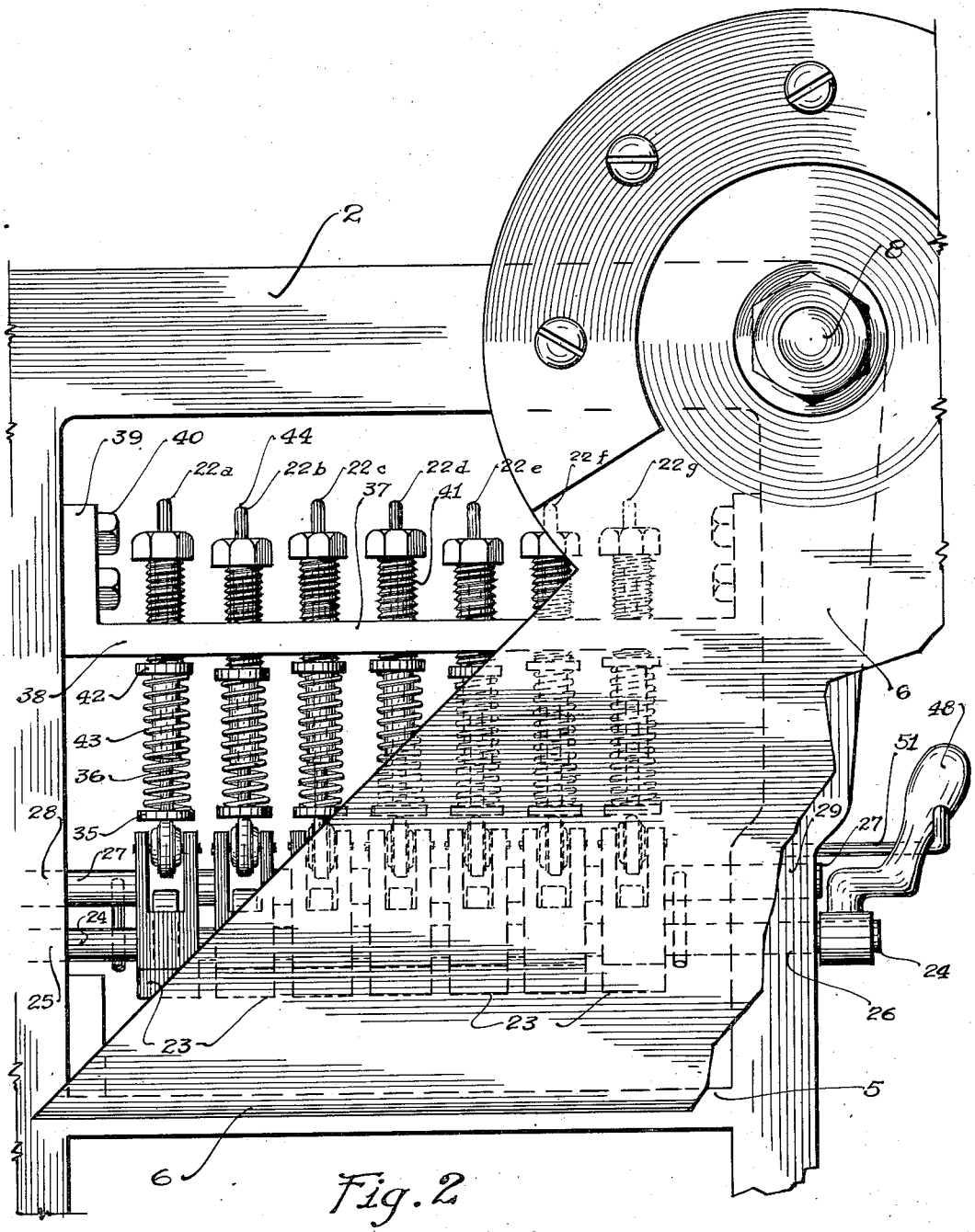


Fig. 2

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SLICING MACHINE

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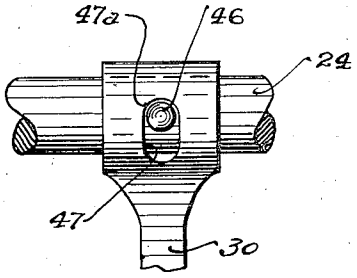


Fig. 4

Fig. 3

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SLICING MACHINE

Filed Sept. 29, 1932 4 Sheets-Sheet 4

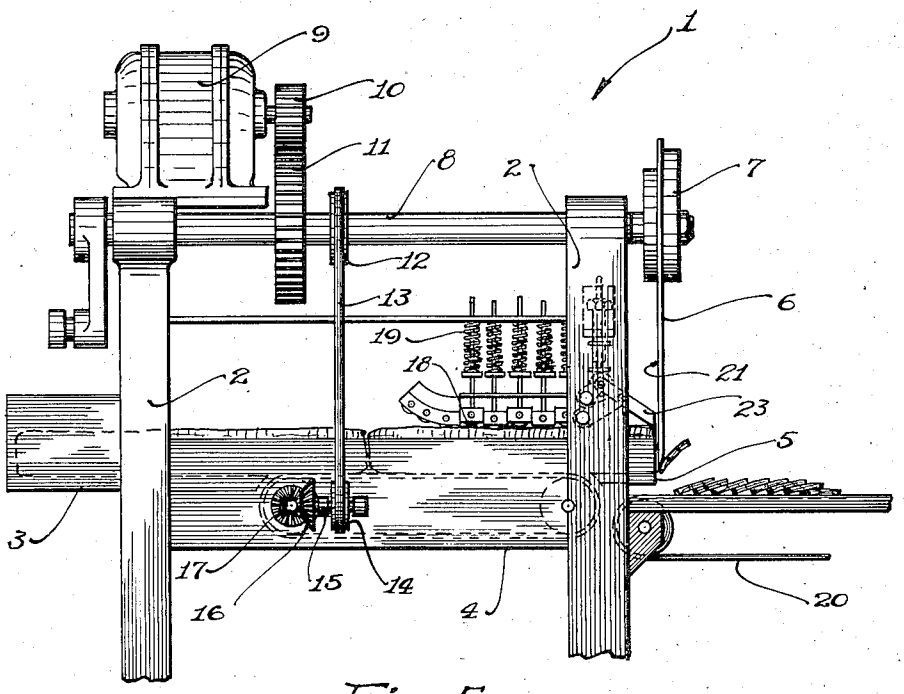


Fig. 5

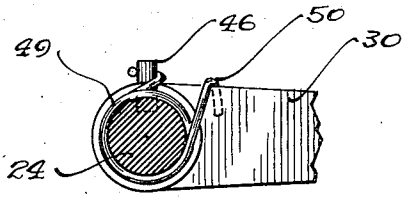


Fig. 6

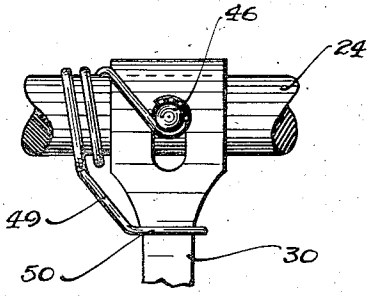


Fig. 7

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Patented Apr. 28, 1936

2,038,770

UNITED STATES PATENT OFFICE

2,038,770

SLICING MACHINE

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Application September 29, 1932, Serial No. 635,383

30 Claims. (Cl. 146—110)

The invention relates to slicing machines and particularly to slicing machines employed for the cutting of slabs of bacon into strips.

Heretofore there has been employed a slicing machine having a knife or cutter movable in a vertically and transversely extending cutting plane for severing the several slices of bacon, one after the other, from a slab of bacon while the latter is supported on a horizontally, transversely and longitudinally extending supporting table with which the cutter is functionally associated and it has also been old in machines of this type to have the supporting table constructed so that it is provided by or with a longitudinally moving conveying element or with other suitable means for effecting longitudinal forward movement of the slabs to the knife or cutter. It has also been old to have associated with such supporting table a spring pressed holding down means for maintaining the slabs in contact with the supporting table, but in the previous machines the holding down mechanism as heretofore constructed has left a considerable gap between the forward end of this upper holding down mechanism on the one hand and the rear face of the cutter on the other, with the result that the product—such as a bacon slab—is not always held as firmly as should be during the several cutting operations to which it must be subjected.

An object of the present invention is to provide a construction that includes a series of holding fingers for engaging a product as a slab of bacon being cut, each of which fingers is yieldable relative to the other and more particularly according to the shape of the upper surface of and under the influence of the product while it is being moved to and while in cutting position, and to insert such construction in the space immediately behind the cutter so that through the functioning of the fingers the product is held and maintained against displacement while being cut.

An important feature essential for these fingers is that the lower forward end thereof shall be located in proximity to the rear of the cutting knife in order to engage the product in the immediate vicinity where the cutting action takes place. The construction thus employed is preferably provided with means so that the fingers normally are spring pressed to holding position. The construction also provides a common operating means through the medium of which all of the fingers can be moved against the pressure of the springs to their retracted inoperative position. In the machine shown, the cutter has not only a shearing cutting action but also to a certain extent a lateral or transverse drawing cutting action as it performs the cutting operation. The fingers are constructed and arranged so that they serve to oppose any tendency for lateral distortion which is incident to this characteristic cutting feature of the knife, and one aspect of the invention relates to the employment in a slicing machine having a cutter of the character mentioned, of yieldable holding fingers that extend forwardly close to the rear face of the knife and which fingers are mounted in a manner to quite firmly engage a product, as a slab of bacon, in the position where the cutting operation is performed with sufficient force to effectively oppose the distortion which would otherwise take place if the peculiar cutting effect inherent to the particular knife were not opposed in some suitable manner as by the finger construction herein described.

With these and other objects in view, the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Reference will now be made to the drawings in detail forming a part of this specification, and in which drawings:—

Figure 1 is a vertical, longitudinal, sectional view showing the forward end of a slicing machine having an endless conveying element which constitutes part of a table or supporting structure upon and along which slabs of bacon are fed in a longitudinally forward direction to a cutter or knife which carries out a cutting operation in a transverse cutting plane that extends at right angles to the longitudinal line of feed. The forward end of the table has an anvil in respect to which the knife functions and from this figure it will be seen that the knife is carried upon a suitable shaft that drives the same and that the machine comprehends a set of spring pressed holding down rollers and also a yieldable finger construction which is located between the front of the pressing or holding down rollers on the one hand and the rear face of the knife on the other. In this figure there is also shown the rear end of an endless delivering conveyor which is relied upon for carrying the severed slices away

from the cutting zone, or in other words, away from the cutting machine.

Fig. 2 is a front elevation—parts at each side thereof being broken away—of the machine. In this figure the cutting knife is shown in the position it occupies at the end of the cutting operation. It will be noted, however, that the right hand section of the cutting knife is broken way. It will also be noted in this figure that the spring pressed finger or finger construction, clearly shown in Fig. 1, is in fact but one of several such fingers or finger constructions that are transversely arranged in respect to each other across the front or forward portion of the machine, but immediately behind the cutter thereof, and in Fig. 2 there is clearly shown a handle that can be relied upon for lifting the fingers from pressing position.

Fig. 3 is a view on a somewhat larger scale than shown in Figs. 1 and 2, of the spring pressed finger construction previously mentioned. In Fig. 3 a portion of the knife is also shown whereby the general position of the fingers in respect to the knife is somewhat more clearly brought out.

Fig. 4 is a detail view showing how the arm that is pivotally connected to the central portion of one of the fingers is mounted upon the shaft that carries the arm.

Fig. 5 is a general side elevation showing practically the entire cutting machine construction and in respect thereto a portion of the endless delivering conveyor. The parts shown in Fig. 5 are on a much smaller scale than in Fig. 1. In the finger arrangement illustrated in Figs. 1 to 5, reliance for the pressing effect is upon a coiled spring located above or at the top of the finger construction.

Figs. 6 and 7 are detail views indicating a modification according to which the specific spring construction of Figs. 1 to 5 can be eliminated or augmented, and another spring construction can be employed in place thereof or in addition thereto.

Reference will now be made to the drawings in detail.

In Fig. 5 the slicing machine as a whole is designated by **1**. It comprises any suitable framework as **2** that supports at the rear or feeding end thereof a fixed rear portion **3** of a receiving and supporting table which also comprehends an endless table member **4** which may be considered as part of the feeding mechanism whereby slabs of bacon or other meat products are fed in a longitudinal forward direction to the cutter or knife of the machine. This endless table member **4** may be considered as part of an endless conveyor that is relied upon for feeding the material or meat products to be sliced, such as slabs of bacon, forwardly to the cutter **6**. At the front end of the machine there is an anvil **5** constituting the forward end of the table structure and which serves to support the forward end of the slab of bacon while being cut. The cutter or knife **6** of the machine is of the revolving type and is secured to and carried at the forward end **7** of the cutter carrying shaft **8** which continuously revolves, whereby the cutter is in fact a continuously operating cutter. The frame of the machine supports any suitable type of motor **9** which operates the shaft through suitable gearing as **10** and **11**. The endless conveying mechanism **4** is operated from the cutter carrying shaft **8** through the medium of chain and gear mechanism—in effect through gear mechanism—comprehending parts such as **12**, **13**, **14**, **15**, **16**, and **17**, all of which parts are suitably supported, but as to which detailed description thereof is not considered necessary, and which function to drive through the medium of or from the cutter carrying shaft the endless feed conveyor **4**.

The fixed rear portion **3**, the endless conveying member **4**, and the anvil **5** constitute a longitudinally, horizontally and transversely extending supporting table upon, along and by which slabs of bacon to be sliced are fed in a general forwardly longitudinal direction to the cutter. The machine is provided with any suitable means as rollers **18** which are spring pressed by springs **19** so as to normally force the slabs of bacon towards the table during the period they are being conveyed forwardly towards the cutter. These rollers are sometimes referred to as yielding or spring pressed holding down rollers because they function to press the slabs of bacon downwardly towards the supporting table and hold them against the same. The machine is also provided with any suitable endless discharge conveying mechanism as **20** which is relied upon to convey the sliced material from the machine as and when produced. This endless conveying mechanism **20** is generally of the continuously moving type.

Reverting now to the construction shown more clearly in Figs. 1, 2 and 3, it will be seen that relatively long space exists between the foremost spring pressed roller **18** and the rear face **21** of the cutter or knife **6**. The knife is constructed so that it functions not merely by a downward shearing action but also by a combined downward shearing and drawing action. This drawing action effect is produced because the knife has a cutting component in a transverse or lateral direction. The cutting effect by the knife tends to cause certain distortion of the material being cut or sliced unless that material is supported against the forces tending to distort it and particularly against the forces tending to distort it in a lateral transverse direction.

To that end and also in order to insure that the bacon slab or whatever meat that is being cut shall be held in place, the finger construction generally designated as **22** has been incorporated in the machine between the pressing rollers **18** and the rear face **21** of the cutter or knife **6**.

This finger construction is made up of a series of elements as 22^a. 22^b, 22^c and etc., and comprises a series of fingers **23**. In Fig. 2 it will be noted that seven of such fingers are included. These fingers are mounted so that the lower ends thereof can yield in a vertical direction, in other words, each finger can move in a vertical, longitudinally extending plane, but they are also mounted so that they do not have movement in a lateral transverse direction, or in other words, so that they oppose movement in a lateral transverse direction. These fingers are under the direct control in so far as movement from operative to inoperative position is concerned, of the shaft **24** which may be considered as the main shaft of the finger construction. This shaft is mounted in suitable bearings provided at **25** and **26** in the upright side members of the main frame and there is located above this main shaft what may be considered as an auxiliary shaft **27** that is in turn mounted in bearings as **28** and **29** in the upright side members of the main frame. It will be observed that the main shaft **24** extends horizontally and transversely of the machine and that it is located behind the cutter and parallel to the

cutting plane thereof and that it is also located above the supporting table and substantially parallel thereto. The auxiliary shaft **27** is also a transversely extending shaft that parallels the main shaft and this auxiliary shaft is mounted behind the cutter and also above the supporting table.

The function of this auxiliary shaft will hereinafter more fully appear. On the main shaft **24** there is pivotally mounted a series of finger carrying arms or levers **30**—sometimes herein referred to as long arms—and these arms or levers **30** are mounted on the shaft **24** in such a manner that these finger carrying arms can swing or have angular movement in respect to the main shaft **24**. The outer or free end of each lever or arm **30** is pivotally connected by a pivot pin **31** to the central portion of the finger **23** that corresponds to the arm or lever. The number of finger carrying arms correspond to the number of fingers. The auxiliary shaft **27** carries a number of short arms **32** that are mounted so as to have free angular movement in respect to the auxiliary shaft carrying the same. In other words, as between the auxiliary shaft and these arms there is no influence to restrain this angular movement so that the finger arms are free to adjust themselves to the outside forces applied thereto. The free end of each short arm is connected by means of a pivot pin **33** to the upper end of one of the fingers **23**. Each pivot pin **33** also carries a roller **34** downwardly, against each one of which there is continuously pressed the lower head member **35** of a forcing plunger **36**.

There is connected to the main frame of the machine a U-shaped cross bar **37**. The bight portion of this U-shaped bar provides a horizontally extending cross bar **38**, the leg portions **39** of the U-shaped bar constituting the members whereby through the medium of bolts **40**, the cross bar member is secured in place on the frame. The horizontally extending cross bar just referred to has a series of screw threaded openings into which adjusting screws **41** enter and through which they pass in order to effect adjustment of the upper collar **42** and thereby the compressive effect of the spring **43** on the lower end of the plunger can be realized.

The plunger **36** has a stem **44** that extends upwardly through the adjusting screw member **41**. From an inspection of the drawings, it will be seen that there is a spring and adjusting screw for each finger **23** and that each finger is yieldably pressed by the spring means just described towards the meat product being sliced. The downward movement, however, of this finger is limited as will now appear. In the first place, the shaft **24** has a pin or restraining member **45** that extends upwardly to a position where it can engage the auxiliary shaft **27** and thus restrain the movement of the shaft **24** from further movement in a clockwise direction. In other words, this pin or restraining member **45** constitutes a stop for the shaft **24**. The shaft **24** in turn carries a series of secondary stops **46**, there being a secondary stop for and corresponding to each finger. The function of these secondary stops is to restrain a movement in a clockwise direction of the finger carrying arms or levers **30** beyond a certain position.

The stops **46** are clearly indicated in Fig. 4 and are sometimes referred to as the arm stops. It will be seen that the lever **30** has a slotted portion **47** which permits a limited upward movement of the free end of the lever **30** in a counter-clockwise direction in order that the finger **23** can adjust itself according to the upward pressure applied to the underside of the finger. With nothing in the machine the finger construction occupies the position shown in Fig. 3. The arm or secondary stops **46** determine this lowest position of the fingers.

It will be noted that the underside of the fingers **23** slope downwardly and forwardly with the result that the meat products or slabs of bacon being fed forwardly through the machine will engage the underside of the fingers **23** and will lift the several fingers **23** upwardly until they assume the position shown for example, in Fig. 1. When in this position it will be noted that the stop **45** may or may not be in engagement with the auxiliary shaft **27** because the finger **30** is enabled to have a limited movement relative to the main shaft **24**—a feature which is inherent to the slotted construction **47**. When in this position it will be observed that the pressure of the fingers **23** against the slab of bacon is in the immediate vicinity of the cutter and is determined as to each finger by the adjusted pressure of the spring **43** which may be adjusted by the operator according to the requirements. There are times when one may desire to collectively lift the lower ends of the fingers **23** and to that end a handle **48** is provided at the right hand end of the main shaft **24**. By pressing this handle **48** so that the shaft moves in a counter-clockwise direction, in other words so that the secondary stops or arm pins **46** thereupon will move downwardly and to the left, it will be observed that the stop **45** will be moved counter-clockwise away from the auxiliary shaft **27**. It will also be observed that the secondary stops or arm pins **46** will engage the rear portion **47a** of the slotted section **47** of the arms **30** in a manner to lift the forward free ends of the finger carrying arms **30**. Consequently, the lifting of the free ends of the arms **30** will thus effect a bodily lifting of the finger of each of the finger arms **23** from the full line position shown in Fig. 3 or from the position shown in Fig. 1 to the dotted line position shown in Fig. 3.

It will also be observed that the lever construction just described is such that it causes the forward free end of the fingers to move in a path substantially parallel to and adjacent the rear surface or face **21** of the knife or cutter **6**. There has previously been described the mechanism which comprises the compression springs **43** as a means for continuously pressing the fingers downwardly. There is shown in Figs. 6 and 7 a construction whereby a downward pressure is applied not to a roller **34** as in the case of the construction of Fig. 3, but by means of a spring **49** that continuously exerts a downward pressure upon the finger carrying arm or lever **30**. This spring is enabled to accomplish this as will be manifest from an inspection of Figs. 6 and 7 because one end thereof is secured to the secondary stud or pin **46** and the other end of which is applied at **50** to the top of the arm or lever **30**. Of course, it must be understood that this spring is coiled about the shaft **24** in such a manner that when thus connected a substantial downward pressure is continuously applied to the arm carrying shaft **30**. When the arrangement of Figs. 6 and 7 is employed as a substitute for the spring **43** it is advisable to fixedly secure the shaft **24** except as to such times as it is desirable to employ the handle **48** for the purpose of raising the parts from the full line position shown in Fig. 3 to the

dotted line position. This securing of the shaft 24 can be readily accomplished by means of the latch construction shown at 51 in Fig. 2. The spring construction of Figs. 6 and 7 could be employed as auxiliary to the pressing effect of spring 43 if desired.

It will be manifest from what has preceded that the several fingers 23 can adjust themselves in a vertical direction according to the thickness of a slab of bacon in the vicinity or region where the cutting operation is being performed. In other words, one finger may be in what may be considered a well at the top portion of the slab while the finger next to it may be somewhat elevated due to a protuberance, but in any event, substantially the same pressure will be applied locally in the immediate vicinity of the cutting operation by the several fingers. Also, it will be seen that while these fingers are arranged so as to yield in an upward direction they are relatively rigid against movement in a direction parallel to the supporting surface of the table, or in other words, these fingers restrain the slabs of bacon against any lateral distortion which tends to take place incident to the cutting operation as carried out.

What is claimed is:

1. In a slicing machine in association with a knife that has a general downward cutting movement, an anvil or lower supporting member with which the knife functionally cooperates to effect a cutting operation as the knife moves downwardly, a holding means comprising a shaft that extends parallel to the cutting plane of the knife and also substantially parallel to the work supporting surface of the anvil, a series of arms mounted on said shaft so as to permit swinging of said arms relative to the shaft but so that the arms extend in a general forward direction towards the rear surface of the knife, a finger pivotally mounted on the forward end of each arm so that the forward end of each finger extends adjacent to and in the immediate vicinity of the rear face of the knife and so that the forward portion of each finger has a general forward and downward inclination on the under surface thereof, and for each finger means normally tending to yieldably press the associated arm and finger to which said means corresponds towards the anvil whereby a piece being sliced is by the several fingers as they collectively function locally engaged and pressed at different places along its width and in the immediate vicinity of the cutting region in a manner to hold the product being cut against substantial local distortion and lateral shifting during the cutting operations.

2. A slicing machine comprising in combination a supporting member along which products as slabs of bacon are fed in a forward longitudinal direction to be cut and upon which the products are supported while being cut, a knife that has a general downward cutting movement and that comprehends a drawing cutting movement in a transverse direction relative to the supporting member, a holding means comprising a shaft that extends parallel to the cutting plane of the knife and also substantially parallel to the supporting surface of the supporting member, a series of arms mounted on said shaft so as to permit swinging of said arms relative to the shaft but so that the arms extend in a general forward direction towards the rear surface of the knife, a finger pivotally mounted on the forward end of each arm so that the lower forward end of each finger extends adjacent to and in the immediate vicinity of the rear face of the knife, each of which fingers has a general forward and downward inclination on the under surface thereof, and means normally tending to yieldably press each associated arm and finger towards the supporting member whereby the product as a slab of bacon being sliced is locally engaged and pressed at different places along its width but in the immediate vicinity of the cutting region in a manner to hold the product being cut against local distortion and lateral shifting during the cutting operations.

3. In a slicing machine a knife movable in a vertically and transversely extending cutting plane, a horizontally, longitudinally and transversely extending supporting member relative to which the knife is functionally associated, a horizontally and transversely extending shaft located in spaced relation to and above the supporting member and also in spaced relation to and behind the knife, the knife having a relatively straight or flat rear face and a cutting edge at the lower portion thereof provided by the bevelling of the front edge of the knife, said shaft being mounted so that it can have angular movement about its axis, a stop for limiting the forward movement as in a clockwise direction of the top portion of the shaft but which permits a limited rearward movement as in a counter-clockwise direction, a handle on the shaft for imparting the rearward or counter-clockwise movement to the shaft as and when desired, a series of second stops on said shaft, a series of arms mounted on the shaft so as to have limited angular movement relative to the shaft, which arms extend forwardly from the shaft towards but only part way to the knife, each said arm being continuously pressed to its normal forward position whereat it engages one of the second stops corresponding thereto, thereby limiting the movement of the arm in a clockwise direction but mounted so that it is permitted a limited yielding movement in a counter-clockwise direction in respect to said shaft, a finger pivotally mounted on the forward free end of each arm so that the lower portion of the finger is inclined forwardly and downwardly and extends in close proximity to the rear face of the cutter, means for guiding each finger so that during bodily movement of the finger as in a vertically upward direction the lower free end thereof will be retained in close proximity relative to the back or rear face of the knife, and means whereby yielding pressure is applied in a manner tending to continuously force the fingers and the arms carrying the same to the lowermost or normal position thereof but which means will permit upward yielding movement of the fingers as required according to the local thickness of the product in the immediate vicinity where the cutting or slicing operation is performed.

4. In a slicing machine, a knife movable in a vertically and transversely extending cutting plane so as to effect a combined downward and transverse drawing cutting action, a horizontally, longitudinally and transversely extending supporting member relative to which the knife is functionally associated, and forwardly and longitudinally along which products to be sliced are fed to the knife, a horizontally and transversely extending shaft located in spaced relation to and above the supporting member and also in spaced relation to and behind the knife, the knife having a relatively straight or flat rear face and a cutting edge provided by the bevelling of a front

edge portion of the knife, said shaft being mounted so that it can have angular movement about its axis, a stop for limiting the forward movement as in a clockwise direction of the top portion of the shaft but which permits a rearward movement as in a counter-clockwise direction, means on the shaft for imparting the rearward or counter-clockwise movement to the shaft as and when desired, a series of second or arm stops on said shaft, a series of arms mounted on the shaft so as to permit limited angular movement relative to the shaft and extended forward from the shaft towards but only part way to the knife, each said arm being limited as to its movement in a clockwise direction but so that it is permitted a limited yielding movement in a counter-clockwise direction in respect to said shaft, each said arm being cooperatively related with one of the arm stops corresponding thereto whereby normal forward position of the arm in a clockwise direction is arrested, a finger pivotally mounted on the forward free end of each arm so that the lower portion of the finger is inclined forwardly and downwardly and extends in close proximity to the rear face of the cutter, means for guiding each finger so that during bodily movement of the finger as in a vertical direction the lower free end thereof will be retained in close proximity relative to the back or rear face of the knife, and means for applying yielding pressure in a manner to continuously force the fingers and the arms carrying the fingers to the normal position therefor but which means will permit upward yielding movement from normal position as required of both the fingers and associated arms according to the local thickness of the product in the immediate vicinity where the cutting or slicing operation is performed.

5. In combination in a slicing machine, a horizontally, transversely and longitudinally extending supporting table, a cutting knife which operates in a vertically and transversely extending cutting plane, a hand operated transversely extending shaft located behind the knife in spaced relation in respect thereto also located above the supporting table in spaced relation thereto, a second shaft located above the first shaft, a series of long arms mounted on the first shaft so as to have angular movement in respect thereto which long arms extend towards the knife, a series of short arms carried by the upper shaft, each of which is angularly movable in respect to the upper shaft, a series of forwardly and downwardly inclined pressing fingers, the intermediate portion of each of which fingers is pivotally connected to the forward end of a long arm corresponding thereto and the upper end of which fingers is pivotally connected to the free end of the short arm corresponding thereto, means for applying spring pressure for normally tending to press the fingers and the arms associated therewith to a lowermost normal position but which yield to permit individual upward movement as required of each arm, the construction being provided with suitable stops which limit the downward movement of the fingers to the normal lower position for the fingers but which also are employed to effect upward movement of the fingers when angular movement in a counter-clockwise direction is imparted to the lower shaft.

6. In a meat slicing machine, a frame, a cutting means, means for the feed of material to the cutting means, yieldable presser means above the material to press the same yieldably on said feeding means for the feed of the material, and means between the cutting means and the yieldable presser means for firmly holding the material during the slicing operation including a second presser means and a plurality of fingers mounted in the frame for vertical pivotal movement and which extend forwardly and downwardly towards the cutting means and terminate at their forward ends relatively close to the cutting means with said forward ends moving vertically substantially parallel with the plane of the cutting means and which are yieldably engageable with the material adjacent the cutting means under the influence of said second mentioned presser means whereby to firmly hold the material adjacent the cutting means during the slicing operation.

7. In a meat slicing machine, a frame, a cutting means, means for the feed of material to the cutting means, yieldable presser means above the material to press the same yieldably on said feeding means for the feed of the material, means between the cutting means and said presser means movable vertically to yieldably engage the material adjacent the cutting means during the slicing operation, means above said holding means to exert downward pressure on said holding means to effect firm engagement of the latter with the material during the slicing operation and yet permit an upward yielding movement of the holding means during the feed of the material to the cutting means, and a movable connection between said material engaging means and said downward pressure exerting means and movable transversely of said downward pressure exerting means as the latter moves into and out of engagement with the material.

8. In a meat slicing machine, a frame, a cutting means, means for the feed of material to the cutting means, yieldable presser means above the material to press the same yieldably on said feeding means for the feed of the material, means between the cutting means and said presser means movably vertically to engage the material adjacent the cutting means during the slicing operation, means above said holding means to exert downward pressure on said holding means to effect firm engagement of the latter with the material during the slicing operation and yet permit an upward yielding movement of the holding means during the feed of the material to the cutting means, and a movable means interposed between the holding means and said pressure exerting means associated therewith to provide a movable operative connection between the holding means and said cooperating pressure exerting means.

9. In a meat slicing machine, a frame, a cutting means associated with the frame, means over which the meat may be fed to the cutting means, a presser means to yieldably press the meat on the means over which the meat is fed to the cutting means and spaced from the latter, means between the cutting means and said presser means to engage the meat adjacent the cutting means to yieldingly hold the meat adjacent the cutting means during the slicing operation under which the meat passes to the cutting means, and means including a spring actuated plunger coacting with the meat holding means to exert pressure on the latter to force it into firm holding engagement with the meat and yet permit upward yielding of the holding means, and means movably carried by the holding means and movably engageable by the inner end of the spring actuated plunger to take the thrust of the plunger in

forcing the holding means into engagement with the meat.

10. In a meat slicing machine, a frame, a cutting means associated with the frame, means over which the meat may be fed to the cutting means, a presser means to yieldably press the meat on the means over which the meat is fed to the cutting means and spaced from the latter, means between the cutting means and said presser means to engage the meat adjacent the cutting means to yieldably hold the meat adjacent the cutting means during the slicing operation and under which the meat passes to the cutting means, and means including a spring actuated device and a movable element interposed therebetween and the holding means to normally exert pressure on the interposed element and said holding means to hold the latter yieldably in firm engagement with the meat during the slicing operation.

11. In a meat slicing machine, a frame, a cutting means associated with the frame, means over which the meat may be fed to the cutting means, a presser means to yieldably press the meat on the means over which the meat is fed to the cutting means and spaced from the latter, means between the cutting means and said presser means to engage the meat adjacent the cutting means to yieldably hold the meat adjacent the cutting means during the slicing operation and under which the meat passes to the cutting means, means including a spring actuated device and a movable element interposed therebetween and the holding means to normally exert pressure on the interposed element and said holding means to hold the latter yieldably in firm engagement with the meat during the slicing operation, and means for limiting the yieldable movement of said holding means in one direction.

12. In a meat slicing machine, a frame, a cutting means, means for the supporting of meat adjacent to the cutting means, a combined pressure exerting means including a spring actuated plunger having a head at its lower end and a meat holding means including a downwardly and forwardly directed pivoted vertically movable finger having its forward end disposed in close relation to the cutting means to yieldably hold the meat adjacent the cutting means during the slicing operation, and a device interposed between said head of said plunger and the inner end of said finger to take the thrust of said plunger in forcing the finger into said meat engaging position.

13. In a meat slicing machine, a frame, a cutting means, means for the supporting of meat adjacent to the cutting means, a combined pressure exerting means including a spring actuated plunger having a head at its lower end and a meat holding means including a downwardly and forwardly directed pivoted vertically movable finger having its forward end disposed in close relation to the cutting means to yieldably hold the meat adjacent the cutting means during the slicing operation, and a roller interposed between the head of said plunger and the inner end of the finger and against which roller the head of the plunger operates to exert pressure on said finger.

14. In a meat slicing machine, a frame, a cutting means, means for the support of meat adjacent to the cutting means, a combined pressure exerting means including a spring actuated plunger having a head at its lower end and a meat holding means including a downwardly and forwardly directed pivoted vertically movable finger having its forward end disposed in close relation to the cutting means to yieldably hold the meat adjacent the cutting means during the slicing operation, a device interposed between said head of said plunger and the inner end of said finger to take the thrust of said plunger in forcing the finger into said meat engaging position, and a stop device to limit movement of the finger in one direction.

15. In a meat slicing machine, a frame, means on the frame for the support of meat, a cutting means mounted on the frame including a cutting element operable adjacent one end of the frame, means cooperating with the cutting element to hold the meat firmly on said supporting means adjacent the cutting element during the slicing operation, including a shaft mounted transversely in the frame above the meat, a plurality of arms mounted for up and down movement on said shaft and projecting toward the cutting element, a second shaft mounted transversely in the frame above the aforesaid shaft, a plurality of arms carried by the second shaft and arranged above the respective arms of the first mentioned shaft, fingers pivoted intermediate their ends to the arms of the first shaft and having pivotal connection at their inner ends with the arms of the said second shaft, a roller mounted on the pivotal connection between the respective fingers and the respective arms of the second shaft, and spring actuated devices corresponding in number with the sets of arms and fingers and each including a plunger engaging the respective rollers to exert pressure on the respective fingers to normally force the outer ends of the fingers into firm but yielding engagement with the meat adjacent the cutting element.

16. In a meat slicing machine, a frame, means on the frame for the support of meat, a cutting means mounted on the frame including a cutting element operable adjacent one end of the frame, means cooperating with the cutting element to hold the meat firmly on said supporting means adjacent the cutting element during the slicing operation, including a shaft mounted transversely in the frame above the meat, a plurality of arms mounted for up and down movement on said shaft and projecting toward the cutting element, a second shaft mounted transversely in the frame above the aforesaid shaft, a plurality of arms carried by the second shaft and arranged above the respective arms of the first mentioned shaft, fingers pivoted intermediate their ends to the arms of the first shaft and having pivotal connection at their inner ends with the arms of the said second shaft, a roller mounted on the pivotal connection between the respective fingers and the respective arms of the second shaft, spring actuated devices corresponding in number with the sets of arms and fingers and each including a plunger engaging the respective rollers to exert pressure on the respective fingers to normally force the outer ends of the fingers into firm but yielding engagement with the meat adjacent the cutting element, means to limit the vertical movements of the arms on the first mentioned shaft, and means to restrain movement of the first named shaft.

17. In a meat slicing machine, a frame, a meat supporting means, a cutting means operable adjacent one end of the supporting means, and a pressure exerting meat holding means including upper and lower vertically aligning sets of arms pivotally mounted in the frame, fingers pivotally connected to respective upper and lower arms, and spring pressure means for exerting downward

pressure on the fingers to maintain their lower ends yieldably but firmly in engagement with the upper face of the meat at spaced points relatively close to the cutting means to hold the meat against distortion during the slicing operation.

18. In a meat slicing machine, a frame, a meat supporting means, a cutting means operable adjacent one end of the supporting means, a pressure exerting meat holding means including upper and lower vertically aligning sets of arms pivotally mounted in the frame, fingers pivotally connected to respective upper and lower arms, and spring pressure means mounted in the frame and coacting with the fingers to maintain their lower ends yieldably but firmly engaging the upper face of the meat at spaced points relatively close to the cutting means to hold the meat against distortion during the slicing operation, means to limit pivotal movements of the lower arms, and means to limit pivotal movements of the upper arms.

19. In a meat slicing machine, a frame, a meat supporting means, a cutting means including a cutting element having a flat inner face, a spring pressed holding means for holding the meat firmly on said supporting means during the slicing operation, including a downwardly and forwardly directed means extending toward the cutting element and the supporting means to firmly engage the meat on the supporting means along a line parallel with the flat inner face of the cutting element, said holding means having a flat edge portion parallel with the inner flat face of the cutting element, said holding means being movable vertically upwardly against the spring actuated means thereof away from the supporting means by the meat as the meat is moved thereunder, and means for mounting said holding means and operable to move under the influence of the vertical movements of the holding means to maintain the said flat edge portion of the meat holding means substantially parallel with the flat inner face of the cutting element as the holding means moves vertically.

20. In a slicing machine, a frame, a meat supporting means, a cutting means including a cutting element, a series of spring actuated fingers supported pivotally intermediate their ends, and inclined and forced normally downwardly and forwardly towards the cutting element and towards said supporting means, means for pivotally mounting the spring actuated fingers, means for movably mounting the pivotal means of the fingers, the forward ends of the fingers engaging the upper face of the meat close to the cutting element to hold the meat firmly adjacent the cutting element during the slicing operation and incident to the aforesaid mountings, each finger being movable upwardly in a vertical plane independently one of another against the action of the spring actuation thereof and in a vertical plane substantially parallel with the vertical plane of the cutting element.

21. In a slicing machine, a frame, a meat supporting means, a cutting means including a cutting element, a series of spring actuated fingers supported pivotally intermediate their ends, and inclined and forced normally downwardly and forwardly towards the cutting element and towards said supporting means, means for pivotally mounting the spring actuated fingers, means for movably mounting the pivotal means of the fingers, the forward ends of the fingers engaging the upper face of the meat close to the cutting element to hold the meat firmly adjacent the cutting element during the slicing operation and incident to the aforesaid mountings, each finger being movable vertically upwardly in a vertical plane independently one of another against the action of the spring actuation thereof and in a vertical plane substantially parallel with the vertical plane of the cutting element, and means common to all of said fingers whereby to move all of said fingers from their normal operative positions upwardly to a full retracted position.

22. In a slicing machine, a frame, a meat supporting means, a cutting means including a cutting element, a series of spring actuated fingers supported pivotally intermediate their ends and inclined and forced normally downwardly and forwardly towards the cutting element and towards said supporting means, means for pivotally mounting the spring actuated fingers, means for movably mounting the pivotal means of the fingers, the forward ends of the fingers engaging the upper face of the meat close to the cutting element to hold the meat firmly adjacent the cutting element during the slicing operation and incident to the aforesaid mountings, each finger being movable upwardly in a vertical plane independently one of another against the action of the spring actuation thereof and in a vertical plane substantially parallel with the vertical plane of the cutting element, means common to all of said fingers whereby to move all of said fingers from their normal operative positions upwardly to a full retracted position, and means for fastening said common means when thus operated so as to hold said common means to maintain the fingers out of their normal operative positions.

23. In a slicing machine, a frame, a meat supporting means, a cutting means including a cutting element, a series of spring actuated fingers supported pivotally intermediate their ends and inclined and forced normally downwardly and forwardly towards the cutting element and towards said supporting means, means for pivotally mounting the said spring actuated fingers intermediate their ends, the forward ends of the fingers engaging the upper face of the meat close to the cutting element so as to hold the meat firmly adjacent the cutting element during the slicing operation to prevent lateral distortion of the meat during the slicing operation, each finger being movable vertically independently one of another against the action of the spring actuation thereof, and means common to all of said fingers whereby to move all of said fingers from their normal upward position upwardly to a full retracted position.

24. In a slicing machine, a frame, a meat supporting means, a cutting means including a cutting element, a series of spring actuated fingers supported pivotally intermediate their ends and inclined and forced normally downwardly and forwardly towards the cutting element and towards said supporting means, means for pivotally mounting the said spring actuated fingers intermediate their ends, the forward ends of the fingers engaging the upper face of the meat closest to the cutting element so as to hold the meat firmly adjacent the cutting element during the slicing operation to prevent lateral distortion of the meat during the slicing operation, each finger being movable vertically independently one of another against the action of the spring actuation thereof, means common to all of said fingers whereby to move all of said fingers from their

normal upward position upwardly to a full retracted position, and means for fastening said common operating means when operated as aforesaid so as to restrain said common means and thereby maintain the fingers out of their normal operative positions.

25. In a slicing machine, a frame, a meat supporting means, a cutting means including a cutting element, a series of spring actuated fingers supported pivotally on the frame and inclined and forced normally downwardly and forwardly towards the cutting element and towards said supporting means, means providing for the pivotal mounting of said spring actuated fingers, the forward ends of the fingers engaging the upper face of the meat at spaced points close to the cutting element to hold the meat firmly but yieldably adjacent the cutting element during the slicing operation to prevent lateral distortion of the meat during the slicing operation, each finger being movable upwardly in a vertical plane independently of one another against the action of the spring actuation thereof and in a vertical plane substantially parallel with the vertical plane of the cutting element so as to prevent contact of the outer ends of the fingers with the cutting element during said upward vertical movement of the fingers.

26. In a meat slicing machine, a frame, means on the frame for the support of meat, a cutting means mounted on the frame, means cooperating with the cutting means to hold the meat firmly on said supporting means adjacent the cutting means during the slicing operation, including a shaft mounted transversely in the frame above the meat, a plurality of arms mounted for up and down movement on said shaft and projecting toward the cutting means, a second shaft mounted transversely on the frame, a plurality of arms carried by the second shaft, fingers pivoted intermediate their ends to the arms of the first shaft and having pivotal connection at their inner ends with the arms of said second shaft, and means mounted in the frame for exerting pressure on said fingers to normally force the outer ends of the fingers into firm but yielding engagement with the meat adjacent the cutting means.

27. In a meat slicing machine, a frame, a cutting means, means for feeding the material to the cutting means, yieldable presser means above the material to yieldably press the same on said feeding means, a second presser means arranged between the cutting means and the aforesaid yieldable presser means, said second presser means comprising a plurality of spring actuated plungers in operative relation with a plurality of pivoted fingers, said plungers providing means for yieldably forcing one of the ends of said fingers into engagement with the material adjacent the cutting means whereby the foremost end of the material is yieldably but firmly held during the slicing operation, and means for limiting the yielding movement of said fingers in the direction of the material.

28. In a meat slicing machine, a frame, a cutting means associated with the frame, means over which the meat may be fed to the cutting means, a presser means for yieldably pressing the meat on the feeding means, finger means under which the meat passes to the cutting means pivotally positioned between said cutting means and said presser means for engaging the meat adjacent the cutting means whereby the meat is yieldably held adjacent the cutting means during the slicing operation and vertically disposed spring actuated plunger means cooperatively positioned above said finger means, said plunger means providing means for exerting pressure downwardly in a vertical direction on the inner side of said finger means and at a point above the pivot of said finger means whereby the latter are yieldably maintained in engagement with the meat adjacent the cutting means.

29. In a meat slicing machine, a frame, a cutting means associated with the frame, means over which the meat may be fed to the cutting means, a presser means for yieldably pressing the meat on the feeding means, finger means under which the meat passes to the cutting means pivoted intermediate their inner and outer ends and positioned between said cutting means and said presser means to engage and yieldably hold the meat adjacent the cutting means during the slicing operation, and rigid spring actuated plunger means above said finger means, the lower ends of said plunger means operating on the inner portions of said finger means at a point above the pivot of said finger means to force the latter into yieldable engagement with the meat.

30. In a meat slicing machine, a frame, a cutting means and means arranged adjacent the cutting means for firmly holding the material during the slicing operation, said holding means comprising a presser means including a plurality of spring actuated vertically disposed plungers in operative relation with a plurality of fingers pivotally mounted in the frame for vertical pivotal movement under the influence of said plungers, said fingers at one end being extended forwardly and downwardly towards the cutting means and terminated at their forward ends relatively close to the cutting means, and said fingers being mounted and arranged for pivotal movement independent of one another with their outer ends maintained in a plane substantially parallel with the vertical plane of the cutting means to prevent contact of the said outer ends of the fingers with the cutting means during vertical movement of the fingers.

CHARLES LOUIS STRAETEN.

CERTIFICATE OF CORRECTION.

Patent No. 2,038,770. April 28, 1936.

CHARLES LOUIS STRAETEN.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 30, after "that" insert the article a; page 5, second column, line 65, claim 9, for "yieldingly" read yieldably; and line 67, claim 9, strike out the word "and" and insert the same before "under" in line 66, same claim; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 28th day of July, A. D. 1936.

Henry Van Arsdale
Acting Commissioner of Patents.

(Seal)