July 9, 1935. H. H. McKEE ET AL 2,007,339

SLICE EVENER AND STACKER

Filed Oct. 1, 1932 3 Sheets-Sheet 1

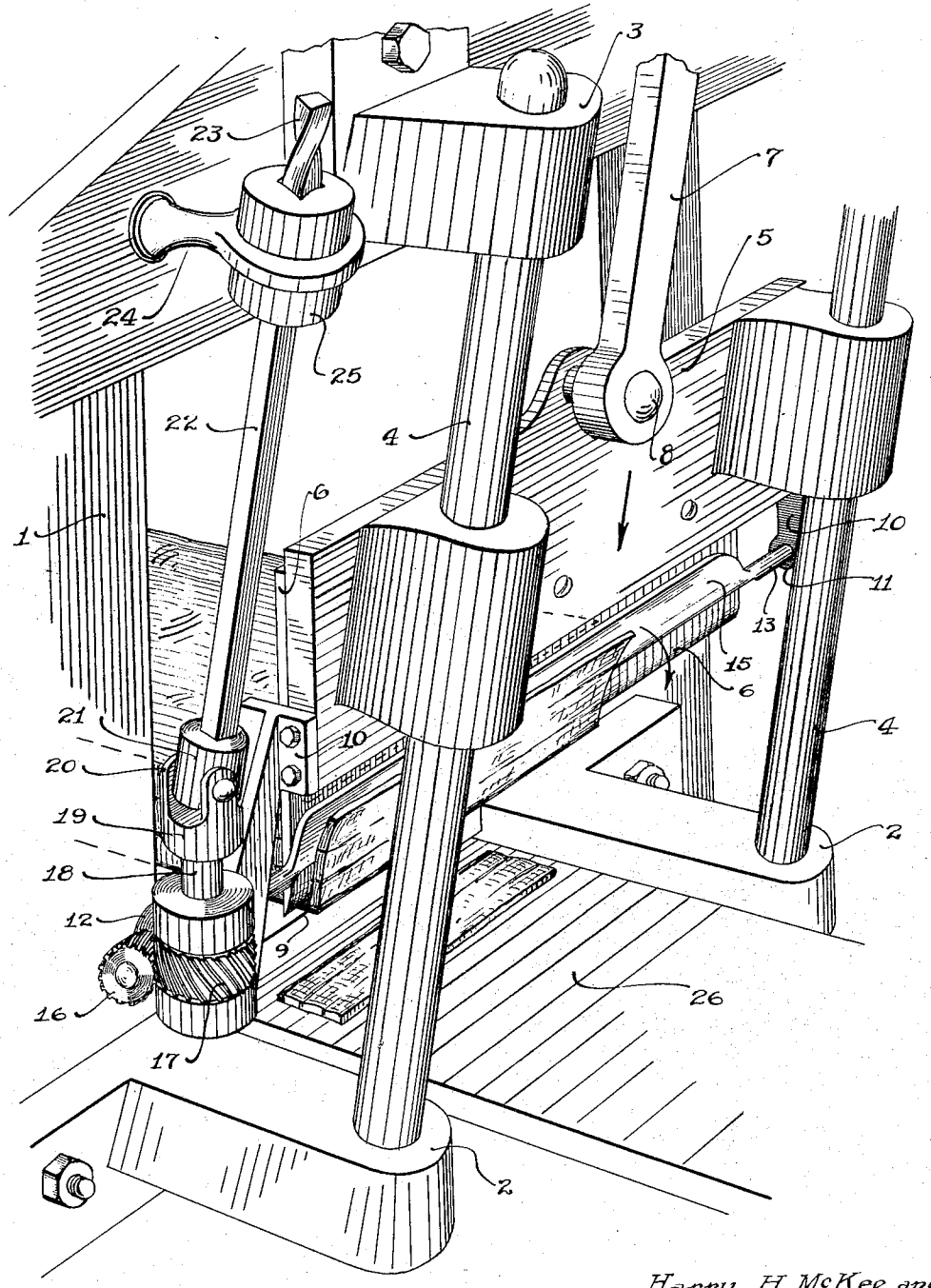


Fig. 1

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SLICE EVENER AND STACKER

Filed Oct. 1, 1932 3 Sheets-Sheet 2

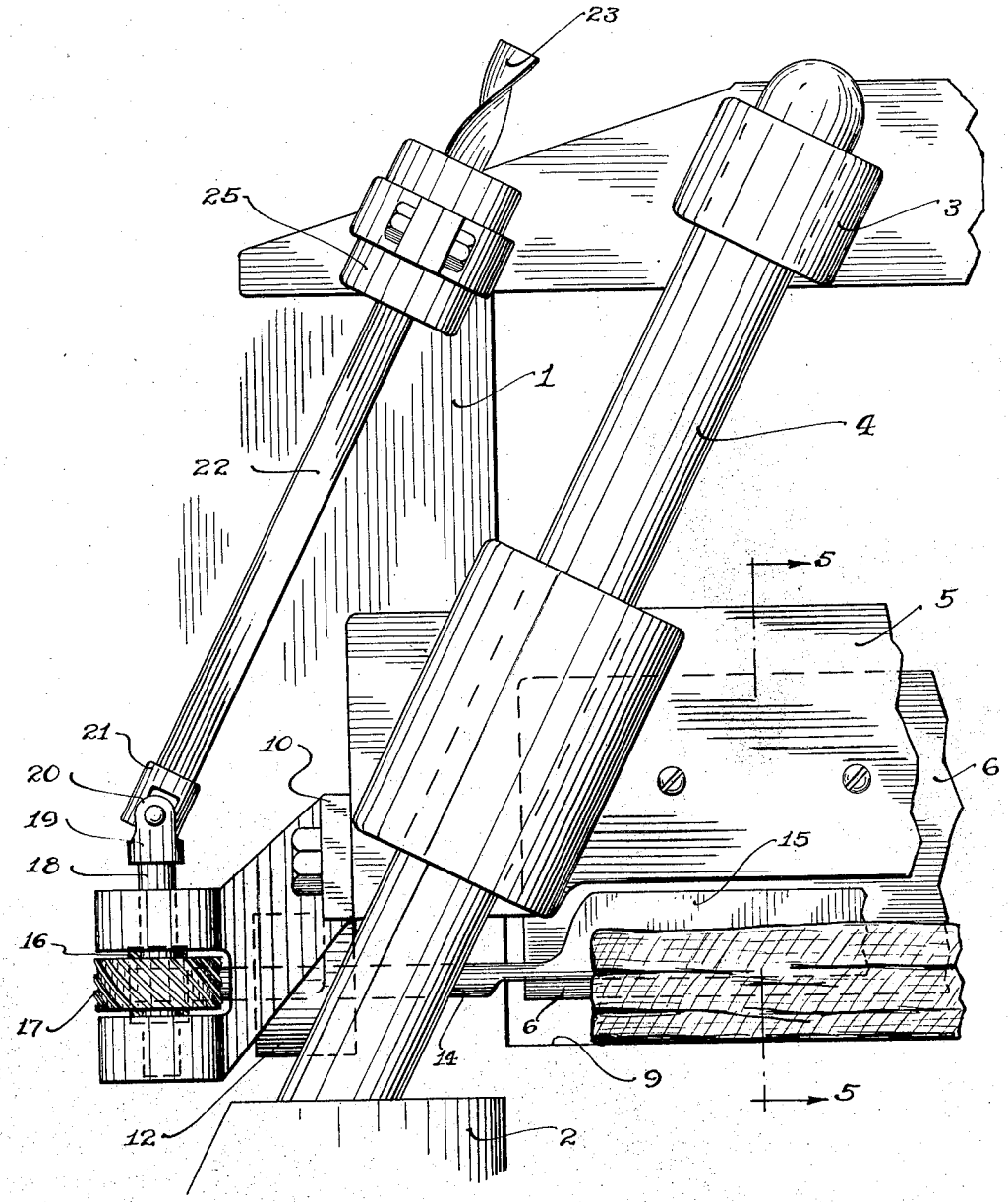


Fig. 2

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Filed Oct. 1, 1932 3 Sheets-Sheet 3

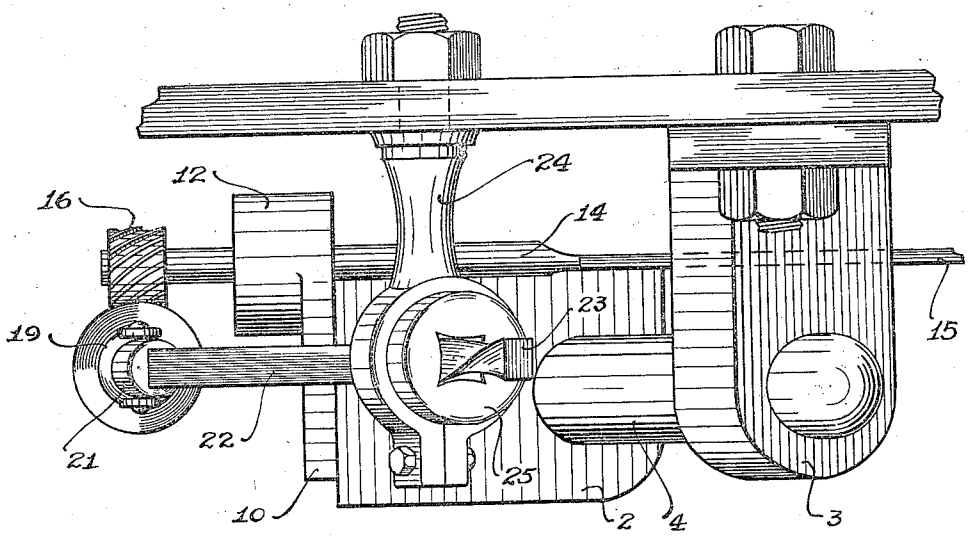


Fig. 3

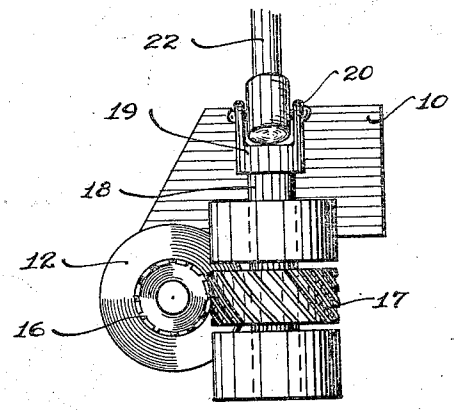


Fig. 4

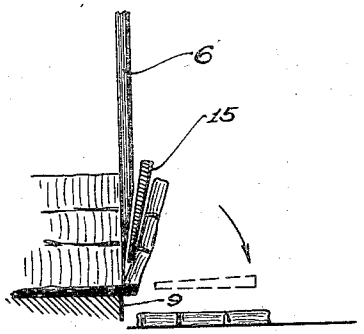


Fig. 5

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Patented July 9, 1935 2,007,339

UNITED STATES PATENT OFFICE

2,007,339

SLICE EVENER AND STACKER

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Application October 1, 1932, Serial No. 635,808

11 Claims. (Cl. 146—159)

This invention relates to machines particularly adaptable for slicing slabs of bacon and particularly to that type of machine in which the slicing is effected by means of a reciprocating knife having a straight cutting edge. Machines of this type are generally employed in conjunction with a conveying element that is arranged to receive the slices of bacon as delivered thereto from the slicing machine and to conduct the slices away from the machine during the normal functioning of the several parts. It is desirable that the slices be delivered upon this conveying or receiving element in a uniform manner and arrangement and to that end an object of the present invention is to provide a member for effecting a stacking or evening of the slices in respect to each other as the cutting operation is completed, and to accomplish this there is provided a member which is arranged near the forward or delivery side of the knife and near the lower cutting edge thereof and which member is caused to automatically operate in such a manner that when the cutting operation for a particular slice is completed, the slice evener or stacker swings forwardly and downwardly about its lower edge portion as an axis and so that it causes a relatively flat and uniform delivery of the piece just severed upon and in respect to, or at least in overlapping arrangement in respect to, the slice previously cut and delivered.

Another object of the invention is to construct a mechanism whereby this automatic movement of the stacker and evener is enabled to be realized.

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 set forth 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 of the invention or sacrificing any of the advantages thereof.

As illustrating a specific form of apparatus in which the invention may be realized, reference is made to the accompanying drawings, forming part of this specification and in which drawings,

Figure 1 is a perspective view showing the forward end of a meat slicing machine that is particularly adaptable for use in the slicing of bacon. In this view, there is illustrated a portion of the main frame of the machine, guideways carried thereby, a knife carrier slidably mounted upon and in respect to said guideways, a knife in position on the carrier, means for effecting reciprocation of the knife carrier, the forward end of the feeding or supporting table, longitudinally along which bacon slabs are fed in a general forward direction to the cutter, a section of a continuously moving receiving and delivering conveyor arranged to receive slices of bacon as and when cut, a slice evener and stacker arranged in front of and near the lower edge portion of the knife, which lower edge portion of the knife constitutes a straight transversely extending cutting edge portion, and mechanism associated with the slice evener and stacker on the one hand and the frame of the machine on the other, whereby the upper portion of the slice evener and stacker is caused to swing about a transversely extending axis that parallels the straight cutting edge of the knife from a normal vertical position forwardly and downwardly in respect to the knife to a horizontal position as the knife approaches the end of its full cutting movement.

Fig. 2 is a view on somewhat larger scale than Fig. 1, and therein the arrangement and construction of the slice evener and stacker and the operating mechanism therefor, particularly in respect to the main frame on the one hand and the cutter on the other, is clearly illustrated. Fig. 2, however, shows only a portion of the cutter and stacker parts, as it would be evident that certain parts shown in Fig. 1 have been broken away.

Fig. 3 is a plan view of that portion of the construction shown in Fig. 2.

Fig. 4 is a detail view showing the relationship of a driven and driving spiral gear which is employed in the operating mechanism for the slice evener and stacker.

Fig. 5 is in effect a diagrammatic view on small scale showing the relationship of the knife or knife carrier on the one hand and the stacker and evener on the other. This figure may be considered as a diagrammatic sectional view taken on the line indicated by 5—5 in Fig. 2. In this Fig. 5, the stacker and evener is shown in its normal upright position by full lines, and in its tilted or horizontal position by dotted lines. Also in this figure there is indicated a slab of bacon, illustrating the manner in which the stacker and evener delivers the bacon to the receiving and delivering conveyor.

Reference will now be made to the drawings in detail. The main frame of the machine is generally indicated by 1, and at the front end thereof it has the forwardly extending lugs or brackets

2 and 3 which provide support for parallel inclined guideways 4, upon which there is slidably mounted a knife or cutter carrier 5 to which there is secured a knife or cutter 6 that performs a slicing or cutting operation by movement in a vertically extending cutting plane. The knife or cutter carrier 5 is reciprocated along the guideways by any suitable mechanism, for example, such as would include the operating connecting rod 7 pivotally connected to the carrier through the medium of pin 8.

The machine has any suitable supporting and feeding means along which slabs of bacon may be fed in a general longitudinal forward direction to the cutter, and the forward end of the machine preferably includes an anvil like construction provided as by the member 9. This anvil member 9 serves to support the bacon slabs while the cutter is moving downwardly towards the same to effect the slicing operation. This anvil 9 may be considered as part of the table supporting mechanism along which the bacon slabs are fed towards the cutter. The guideways 4 for the cutter are inclined and consequently the cutter as it functions has a combined slicing cutting action and a drawing cutting action.

The cutter carrier has secured thereto at opposite sides thereof brackets, as 10, which provide bearings, as 11 and 12, that receive trunnion portions 13 and 14 of the slice evener and stacker 15. This slice evener and stacker comprises a relatively long narrow plate or blade like member which is positioned so that the lower edge thereof is normally located in front of but near the cutting edge portion of the knife. In fact, the lower edge of this stacker is in substantial alignment with the axis of the trunnion members and is preferably beveled in cross section so that it can be readily assembled in close relationship in respect to the knife, as will be manifest from an inspection of Fig. 5. The cutter, as previously indicated, has a lateral or transverse movement in respect to each slice of bacon during cutting, and the same is true of the evener and stacker, with the result that there is little tendency, where the inclined knife carrier guides are employed, for the bacon slices to stick or adhere to either the knife or the stacker.

On trunnion portion 14 of the stacker and evener, there is secured a driven spiral gear 16. The bracket 10 also carries therein a driving spiral gear 17, which is always in mesh with the driven spiral gear 16. This driving spiral gear 17 is connected to a shaft 18, and the upper end of this shaft 18 has secured thereto a driven member 19 of a universal coupling arrangement 20, the driving member of which universal coupling is indicated by 21. It will be noted that the several parts just referred to, to wit, the slice evener and stacker 15, the trunnion 14 thereof, the driven spiral gear 16 thereupon, the driving gear 17, the universal coupling 20, and also a rod 22 having a twisted portion 23 forming a spiral element, all move up and down as the cutter carrier 5 is moved up and down, and consequently may be referred to as mechanism which is connected to the knife carrier 5 and which is movable up and down by and with the knife carrier 5.

A member 24 is carried on the main frame and to this there is fixedly secured and supported in place a member 25 which is constructed so as to provide a guideway along and in engagement with which the rod 22 and the spiral portion 23 thereof move. In fact, the engagement between the rod 22 on the one hand and this fixed guide member 25 on the other is of such character that angular movement is imparted to the rod 22 as and when the spiral portion of the rod moves along in operative engagement with the fixed guide 25. This engagement of the spiral portion 23 of the rod 22 with the fixed guide 25 is relied upon for effecting the proper movement of the slice evener and stacker both to swing the slice evener and stacker from normal vertical position to a horizontal position as the knife approaches the end of its cutting operation, and to restore the slice evener or stacker to its vertical position as the knife is moved upwardly from its full cutting position. It will also be observed that, broadly considered, the mechanism which comprehends the cooperating spiral gears, the rod 22 with the spiral portion, and the fixed guide 25, may be considered as mechanism which is cooperatively arranged with respect to the frame on the one hand and the knife carrier on the other, for effecting the proper movement of the slice evener and stacker in respect to the knife on the carrier as and when the carrier functions to move the knife towards and from full cutting position.

The slices as delivered drop on a continuously moving receiving and conveying member 26. Where the slice evener and stacker is not employed, there is sometimes experienced a more or less uneven arrangement of the slices one in respect to the other, and the function of this slice evener and stacker is to effect a more uniform and positive arrangement of the slices one in respect to the other, as the slicing machine functions.

What is claimed is:

1. A slicing machine comprising in combination a main frame, parallel guideway providing means carried by the frame, a knife carrier slidably mounted on said guideway providing means, means for supporting meat products during a slicing operation, a transversely extending knife secured to said carrier and means for reciprocating said carrier so that the knife thereupon moves towards and from said supporting means and in relation thereto in a manner to effect a slicing operation when the cutter is moving towards said supporting means, said mechanism being characterized in that the knife carrier carries a slice evener and stacker provided by a transversely extending member having a relatively narrow lower edge that is arranged along and adjacent the forward face portion of the knife and only a short distance from the lower cutting edge portion of the knife, and in that the mechanism has means cooperatively associated with the frame on the one hand and the transversely extending stacker and evener on the other hand, and constructed so as to effect an angular movement of the stacker or evener in a manner to swing the upper portion of the stacker or evener in a forward, downward direction until the normal front face of the stacker is moved to substantially a right angle position in respect to the cutting plane and so that as the knife carrier moves upwardly during its return movement the stacker will be restored to a normal relatively upright position whereat it remains until the cutter carrier is near the end of its travel for the succeeding cutting operation.

2. A slicing machine as per claim 1 in which the parallel guideways are laterally inclined relative to the supporting means whereby the cutting operation that is carried out comprehends a drawing cutting action as well as a shearing cut-

ting action, in which the transversely extending stacker or evener member is carried by trunnions that extend transversely into bearing members that are mounted upon and that are located at opposite sides of the knife carrier, in which one of the trunnion members has a driven spiral gear member secured thereto, in which a driving spiral gear meshing with the driven spiral gear is carried in and by a bracket member secured to or constituting part of the knife carrier, in which a fixed guide member is secured to the main frame and in which a movable member having a spiral or twisted portion has a sliding engagement with the fixed guide member and is connected by a universal joint construction to the driving spiral gear, the construction being such that as the knife carrier is imparted a sufficient downward cutting movement the stacker is caused to have an angular movement imparted thereto in a manner to swing the upper part of the stacker from upper position downwardly and forwardly to a horizontal position.

3. A slicing machine comprising in combination, a main frame, a knife carrier movably mounted on said main frame, a transversely extending knife secured to said carrier and having a relatively straight transversely extending cutting edge at the lower portion thereof, means for reciprocating said carrier so that the knife moves toward and from cutting position, a slice evener and stacker provided with a transversely extending member that is arranged along and adjacent the forward face portion of the knife and only a short distance from the lower cutting edge of the knife so as to have angular movement about an axis that parallels said cutting edge, and means cooperatively associated with the frame on the one hand and the transversely extending stacker on the other hand for effecting an angular movement of the stacker and evener as the knife carrier approaches the end of its downward movement toward full cutting position, said knife carrier being mounted so that when operated the cutter has a drawing cutting action as well as a shearing cutting action and the stacker and evener being carried by trunnions that extend transversely into bearing members mounted at opposite sides of the knife carrier, in which one of the trunnions has a driven spiral gear member secured thereto, in which a driving spiral gear meshing with the driven spiral gear is carried in and by a bracket member secured to a part of the knife carrier, in which a fixed guide member is secured to the main frame and in which a movable member having a twisted or spiral portion has a sliding engagement with the fixed guide member and is connected by a universal joint construction to the driving spiral gear, the construction being such that as the knife carrier is imparted a downward cutting movement the stacker is caused to have an angular movement imparted thereto in a manner to swing the upper part of the stacker and evener from upper position downwardly and forwardly.

4. A slicing machine comprising in combination a main frame, a knife carrier, means for supporting meat products during a slicing operation, a transversely extending knife on said knife carrier having a lower straight cutting edge, means for reciprocating said carrier so that the knife thereon moves toward and from said supporting means and in relation thereto in a manner to effect a slicing operation when the cutter is moving toward said supporting means, a slice evener and stacker located in front of the lower cutting edge of the knife and slightly above said cutting edge, and means cooperatively associated with the frame on the one hand and the stacker and evener on the other hand for effecting angular movement of the stacker and evener about an axis that parallels said straight lower cutting edge of the knife as the knife approaches its lowermost cutting position, said knife in the cutting operation comprehending a drawing cutting action as well as a shearing cutting action and the angular movement of the stacker and evener being effected through the medium of mechanism that comprehends associated members, one of which members is carried by the frame and the other of which members is operatively connected to the stacker and evener, one of said associated members being a rod that has a twisted or spiral portion which slidably engages the other member and which is relied upon to effect the angular movement of the stacker and evener.

5. A slicing machine comprising a frame, a reciprocating knife carrier movable upwardly and downwardly on the frame and provided with a knife having a lower cutting edge, means for guiding the knife carrier on the frame, a slice evener and stacker movable with the knife carrier and located in front of the cutting edge of the knife and extending along the same in close proximity thereto, means for mounting the slice evener and stacker so as to permit the same to have angular movement toward and from the knife, and means connected with the knife evener and stacker for effecting angular movement of the evener and stacker as the knife approaches its lowermost cutting position.

6. A slicing machine comprising a frame, a reciprocating knife carrier movable upwardly and downwardly on the frame and provided with a knife having a lower cutting edge, means for guiding the knife carrier on the frame, a slice evener and stacker pivotally mounted on the knife carrier and located in front of the cutting edge of the knife and extending along the same in close proximity thereto and arranged to swing downwardly and upwardly toward and from the adjacent face of the knife, and means connected with the knife evener and stacker for effecting a downward swinging movement of the same as the knife approaches its lowermost cutting position.

7. A slicing machine comprising a frame, a reciprocating knife carrier movable upwardly and downwardly on the frame and provided with a knife having a lower cutting edge, means for guiding the knife carrier on the frame, a slice evener and stacker located in front of the cutting edge of the knife and extending along the same in close proximity thereto and provided at its ends with trunnions mounted on the knife carrier and arranged to permit the evener and stacker to swing downwardly and upwardly toward and from the knife, and means connected with the knife evener and stacker for effecting a downward swinging movement of the stacker as the knife approaches its lowermost cutting position.

8. A slicing machine comprising a frame, a reciprocating knife carrier movable upwardly and downwardly on the frame and provided with a knife having a lower cutting edge, means for guiding the knife carrier on the frame, a slice evener and stacker located in front of the cutting edge of the knife and extending along the same in close proximity thereto and provided at its ends with trunnions mounted on the knife carrier to permit the evener and stacker to swing down-

wardly and upwardly, and means connected with the knife evener and stacker for effecting a downward swinging movement of the stacker as the knife approaches its lowermost cutting position, said means including gearing connected with one of the trunnions for effecting the said swinging movement of the slice evener and stacker, and mechanism connected with the gearing and actuated through the reciprocation of the knife carrier for driving the said gearing.

9. A slicing machine comprising a frame, a reciprocating knife carrier movable upwardly and downwardly on the frame and provided with a knife having a lower cutting edge, means for guiding the knife carrier on the frame, a slice evener and stacker located in front of the cutting edge of the knife and extending along the same in close proximity thereto and provided at its ends with trunnions mounted on the knife carrier to permit the evener and stacker to swing downwardly and upwardly, means connected with the knife evener and stacker for effecting a downward swinging movement of the stacker as the knife approaches its lowermost cutting position, said means including gearing movable with the said carrier and connected with one of the trunnions for effecting the said swinging movement of the slice evener and stacker, a slidable member connected with one of the gears and having a spiral portion, and a fixed guideway through which the slidable member moves and which engages the spiral portion of the same for effecting a rotary movement of the slidable member and the gear to which the same is connected.

10. A slicing machine comprising a frame, a reciprocating knife carrier movable upwardly and downwardly on the frame and provided with a knife having a lower cutting edge, means for guiding the knife carrier on the frame, a slice evener and stacker located in front of the cutting edge of the knife and extending along the same in close proximity thereto and provided at its ends with trunnions mounted and arranged to permit the slice evener and stacker to swing downwardly and upwardly, a driven gear fixed to one of the trunnions, a bearing bracket mounted on the knife carrier adjacent the said gear, a shaft mounted in the bearing bracket and provided with a driving gear meshing with the said driven gear, a fixed member mounted on the frame of the machine and spaced from the bearing bracket and having a guideway, and a slidable member connected with the said shaft and operable in the guideway and having a spiral portion arranged to be engaged by the guideway for rotating the slidable member and actuating the driving gear for effecting a downward swinging movement of the evener and stacker as the knife approaches its lowermost cutting position.

11. A slicing machine comprising a frame, a reciprocating knife carrier movable upwardly and downwardly on the frame and provided with a knife having a lower cutting edge, means for guiding the knife carrier on the frame, a slice evener and stacker located in front of the cutting edge of the knife and extending along the same in close proximity thereto and provided at its ends with trunnions mounted and arranged to permit the slice evener and stacker to swing downwardly and upwardly, a driven gear fixed to one of the trunnions, a bearing bracket mounted on the knife carrier adjacent the said gear, a shaft mounted in the bearing bracket and provided with a driving gear meshing with the said driven gear, a fixed member mounted on the frame and located above the bearing bracket and provided with a guideway, a slidable rod operable in the guideway, and a universal joint having members connected respectively with the said shaft and with the slidable rod, the latter being provided at its upper end with a spiral portion arranged to be engaged by the said guideway for rotating the driving gear for swinging the slice evener and stacker downwardly as the knife approaches its lowermost cutting position.

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