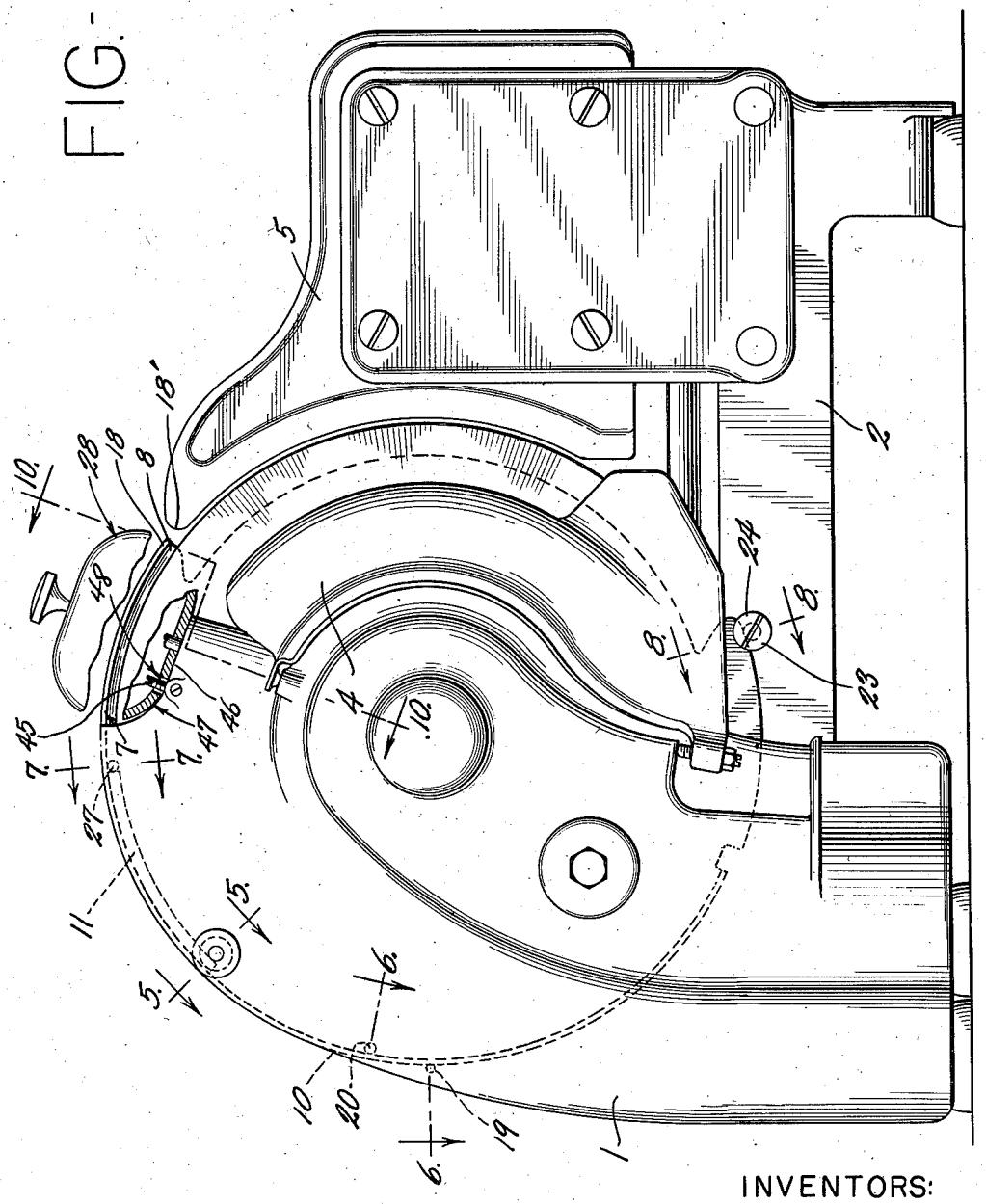
Aug. 25, 1936. A. H. AHRNDT ET AL 2,052,366

SLICING MACHINE KNIFE GUARD AND GRINDING MECHANISM

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FIG. 1.



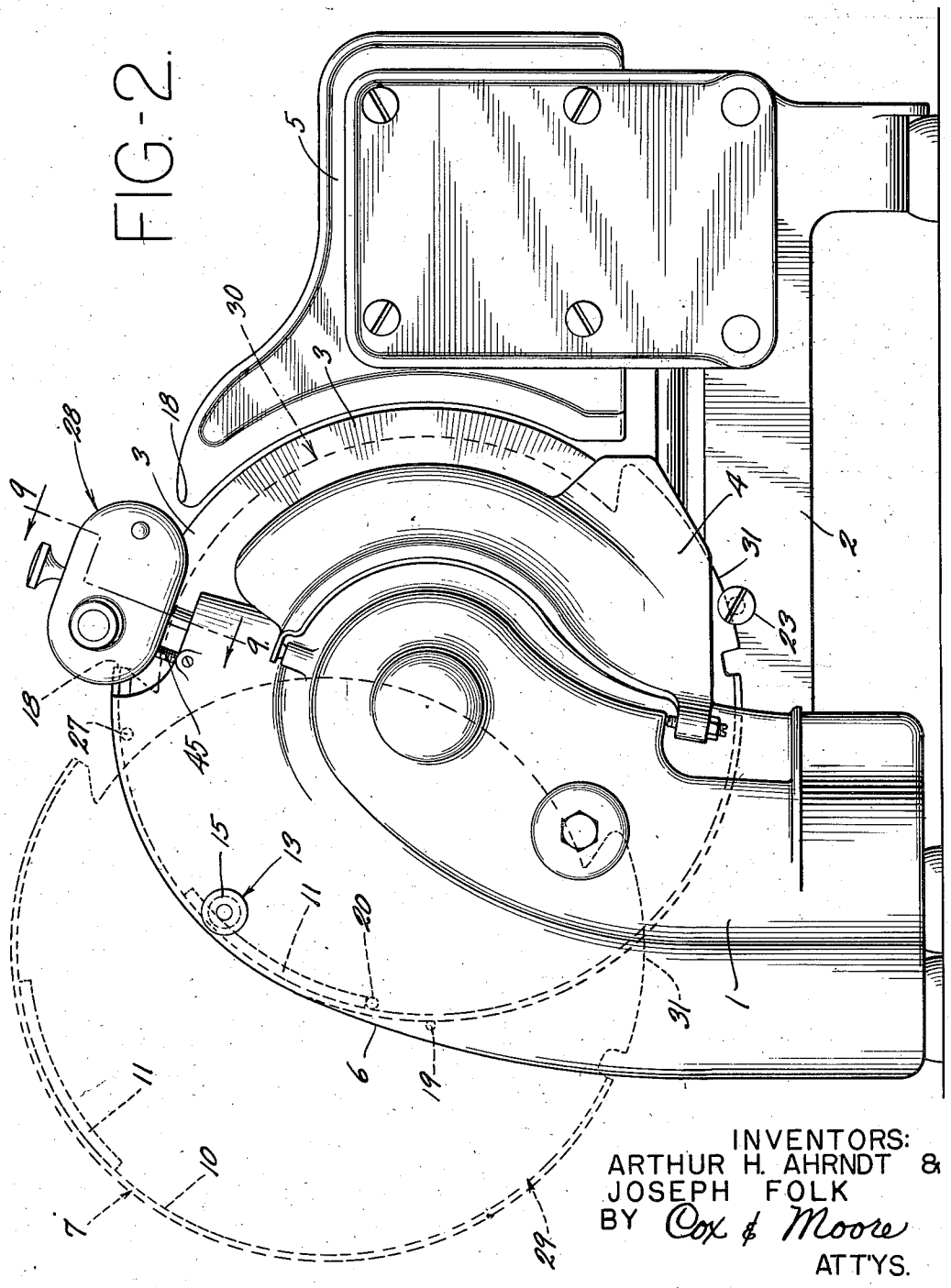
INVENTORS:
ARTHUR H. AHRNDT &
JOSEPH FOLK
BY Cox & Moore
ATT'YS.

Aug. 25, 1936. A. H. AHRNDT ET AL 2,052,366

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FIG-2.



INVENTORS:
ARTHUR H. AHRNDT &
JOSEPH FOLK
BY Cox & Moore
ATT'YS.

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FIG.-3.

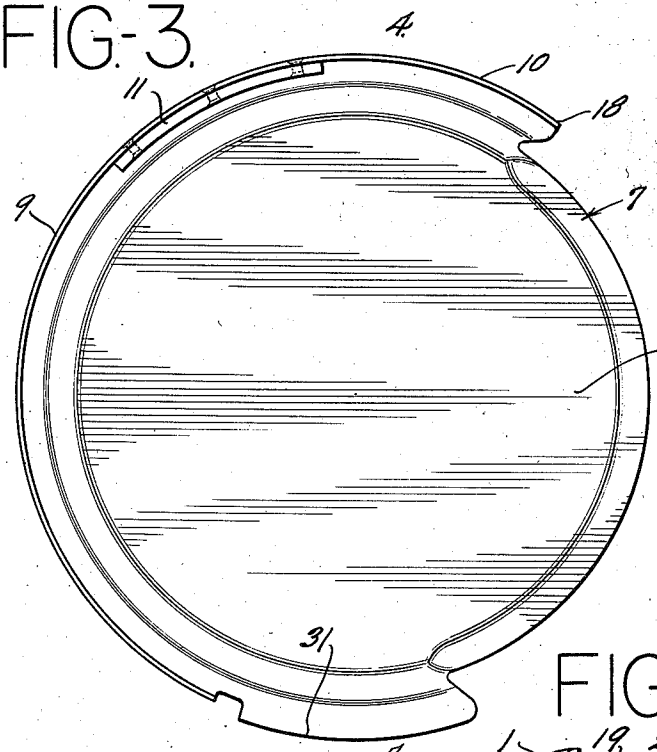


FIG.4.

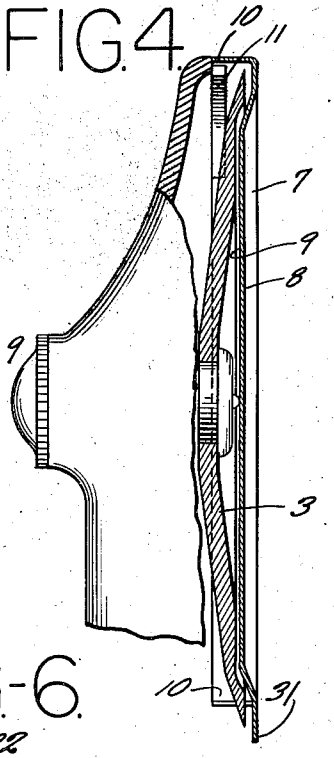


FIG.-6.

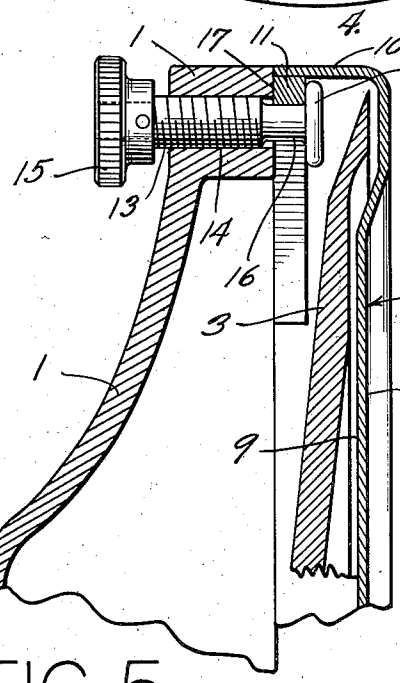


FIG.-5.

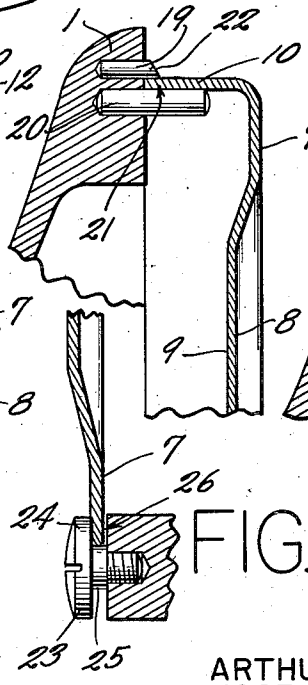


FIG.-8.

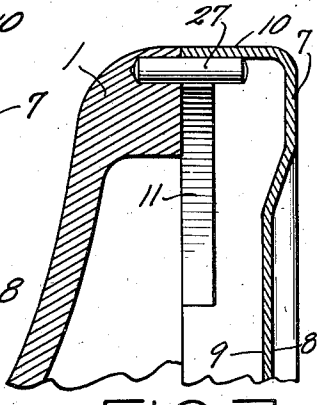


FIG.7.

INVENTORS:
ARTHUR H. AHRNDT &
JOSEPH FOLK
BY Cox & Moore
ATT'YS.

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FIG.-9.

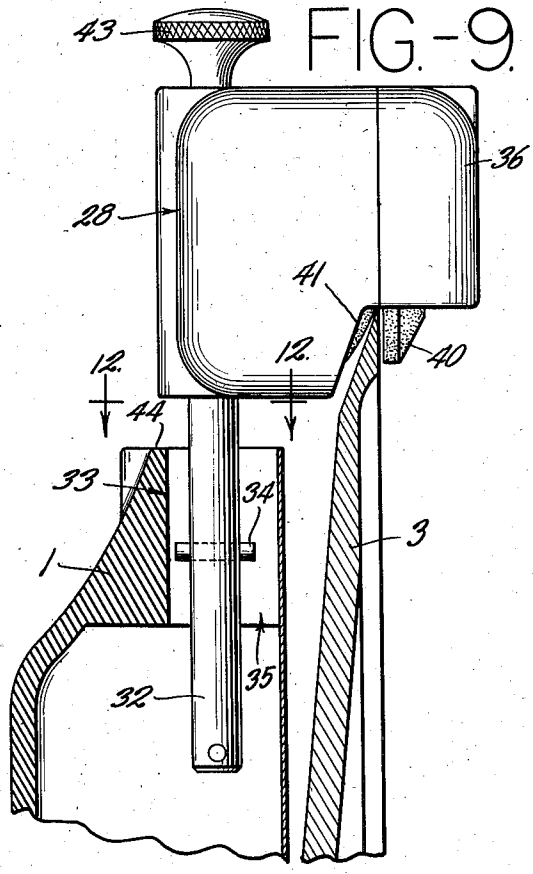
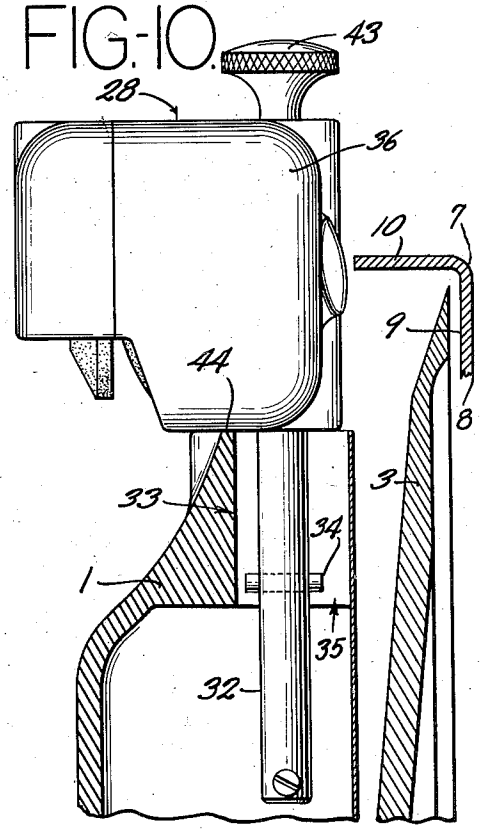


FIG.-10.



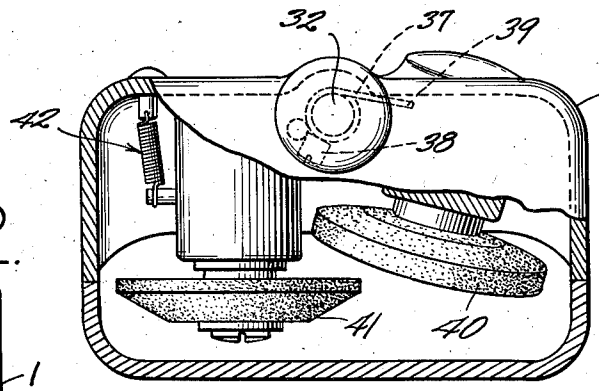
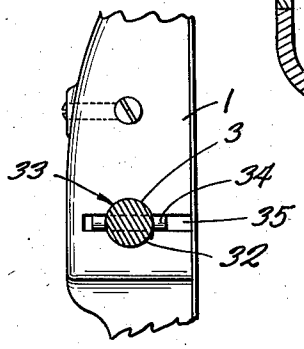


FIG.-11.

FIG.-12.



INVENTORS:
ARTHUR H. AHRNDT &
JOSEPH FOLK
BY Cox & Moore
ATT'YS.

Patented Aug. 25, 1936 2,052,366

UNITED STATES PATENT OFFICE

2,052,366

SLICING MACHINE KNIFE GUARD AND GRINDING MECHANISM

Arthur H. Ahrndt and Joseph Folk, La Porte, Ind., assignors to U. S. Slicing Machine Company, La Porte, Ind., a corporation of Indiana

Application April 2, 1934, Serial No. 718,583

12 Claims. (Cl. 146—102)

This invention relates to slicing machines, and particularly to a knife guard therefor.

The primary object of the invention is to provide an improved, smooth, clean, readily accessible, quickly demountable knife guard for knives on slicing machines.

Another object of the invention is to provide novel and new means for supporting the knife guard in juxtaposition in relation to the knife, and which is provided with means for permitting ready attachment and detachment of the guard in position on the knife.

A further object of the invention is to provide a one-piece removable knife guard and plate which has means for permitting ready attachment and replacement thereof, and which cooperates with a bracket having a cut away portion to removably receive a novel sharpening mechanism.

A still further object is to provide an improved knife guard and plate, and a new and novel sharpening mechanism whereby the casing of the sharpening mechanism acts as a partial guard for the knife and cooperates with a part of the knife bracket in that it has nesting relationship therewith.

Still another object of the invention is to provide a sharpening mechanism which is normally swung out of position in respect to the knife, and therefore is out of close proximity to the knife and prevents soiling of the sharpening stones from the grease and matter thrown up by the knife during its operation, the sharpener mechanism adapted to be swung on its pivot substantially 180° into juxtaposition as regards the knife, so that the knife may be readily ground or sharpened upon manual manipulation of the sharpener mechanism housing; the housing of the sharpening mechanism fitting down into a cut away portion of the knife bracket.

Numerous other objects and advantages will be apparent throughout the progress of the following specification.

The accompanying drawings illustrate a selected embodiment of the invention, and the views therein are as follows:

Fig. 1 is a detail elevaticnal view of a slicing machine embodying the invention, and showing the parts in their normal operating position, parts being broken away for the sake of clearness.

Fig. 2 is a similar view showing the sharpening mechanism in sharpening position, and showing the manner in which the improved knife guard is moved during the sharpening operation, and the manner in which the guard may be entirely removed from the machine.

Fig. 3 is a detail elevational view of the improved knife guard.

Fig. 4 is a detail sectional view taken longitudinally through the knife bracket, knife and guard.

Fig. 5 is a detail sectional view on the line 5—5 of Fig. 1.

Fig. 6 is a detail sectional view on the line 6—6 of Fig. 1.

Fig. 7 is a detail sectional view on the line 7—7 of Fig. 1.

Fig. 8 is a detail sectional view on the line 8—8 of Fig. 1.

Fig. 9 is a detail sectional view on the line 9—9 of Fig. 2.

Fig. 10 is a detail sectional view on the line 10—10 of Fig. 1.

Fig. 11 is a detail sectional view taken transversely through the sharpening mechanism housing.

Fig. 12 is a detail sectional view on the line 12—12 of Fig. 9.

The slicing machine herein shown for the purpose of illustration, has a knife supporting bracket rigidly supported on the base 2, and this bracket revolvably supports a slice cutting knife 3. A slice deflector 4 and an adjustably mounted gauge plate 5 are mounted on the left hand side of the machine for a purpose well known in the art. The knife supporting bracket 1 is provided with an extension 6, which forms a guard for the side of the knife at the forward end thereof.

A knife guard 7 is mounted on the right hand side of the knife, and this guard has a front face 8 and a rear or inner face 9 forming the guard plate, Fig. 4. A peripheral flange 10, forming a guard for the cutting edge of the knife, is bent from the guard 7 and extends a predetermined distance around the guard. On the inner face 9 of the guard which is in the form of a plate, there is fastened an arcuate web or projection 11 which is adapted to be engaged by a locking head 12 formed on a set screw 13, Fig. 5. The set screw 13 is threadedly received in a threaded bore 14 in a part of the knife bracket or support, and has a thumb nut or piece 15 for manually operating the set screw. The locking head 12 of the set screw 13 extends outwardly from the reduced portion 16 of the set screw, and provides a recess into which the web or flange 11 projects. When the set screw is turned in one direction, the locking head 12 will securely clamp the web or pro-

jection 11 against the surface 17 of the bracket or support 1. When the set screw is turned in the opposite direction, the locking head 12 is released from the projection or web 11, and therefore the plate is permitted to have free slidable movement in respect to the set screw 13, Fig. 5.

The upper forward end 18 of the guard 7 extends almost to the forward end 18' of the gauge plate 5, Fig. 1, whereby partically the entire periphery of the cutting edge of the knife is guarded. Pins 19 and 20, Figs. 1 and 6, are spaced apart to provide a space or recess 21 therebetween into which the flange 10 of the guard 7 extends. The pin 20 is positioned inwardly and engages the inner face of the flange while the pin 19 is spaced outwardly and engages the outer surface of the flange. The pin 19 has a bevelled end or surface 22 to permit the flange 10 to be easily slipped thereover and be properly positioned in respect to the space 21, so that it can be easily and quickly pushed into the space 21. A stud 23 having a head 24 is fastened to a rigid part of the machine, and has a shoulder 25 upon which the lower end of the guard 7 rests. The shoulder 25 provides a recess 26 into which the lower end of the guard extends, Fig. 8.

When the set screw 13 is loosened to remove the locking head 12 from the web or projection 11, the guard 7 may be rotated a predetermined distance about a central axis. The stud 23 acts as a support for the lower end of the guard and a part of the set screw 13 acts as a support for the upper part of the guard. These two members, therefore, permit the guard to be supported even though the guard is rotated about its central pivot. The pins 19 and 20 also assist in holding the guard in proper position. A pin 27 affixed to a part of the bracket 1 extends inwardly of the knife guard flange 10 and acts as a stop pin for the guard 7, Fig. 7, and against which the web or projection 11 engages during the rotative movement of the guard in one direction. The rotatable movement of the guard 7 is limited in the opposite direction by the pin 20, which engages the opposite end of the web or projection 11. The knife guard, therefore, is free to be rotated a predetermined distance to unguard or uncover a portion of the blade, so that the knife 3 may be sharpened by the sharpening mechanism 28 without removing the guard from the knife.

If and when desired, the guard 7 may be completely removed from the knife. To remove the guard from the knife, all that is necessary is to release the screw 13 and then move the guard rotatively so that the web or projection 11 will be free from the locking head 12. When the web or projection 11 is freed from the clamping action of the set screw 13, the guard may be moved so that the flange 11 will be freed from the pin 20, at which time the guard may be lifted out from engagement with the stud 23 as shown in dotted lines in Fig. 2, and designated generally by the numeral 29. The pivoted or rotated position of the guard is shown in dotted lines in Fig. 2, and is designated in general by the numeral 30. During the pivotal or rotative movement of the guard, the lower end 31 will be supported on the stud 23. It is also guided, as previously mentioned, by the locking head 12 of set screw 13, and the pins 19 and 20, the rotative movement being limited by the pins 27 and 20.

The sharpener mechanism comprises a long vertical pin 32 which operates in an opening 33 formed in a part of the knife supporting bracket 1, Figs. 9, 10 and 12. The pin 32 carries a guide pin 34 which is receivable in a slot 35. This pin 32 carries a housing 36 at its upper end, and this housing is adapted to have limited rotative movement relative to pin 32. The housing is normally urged in one direction by a spring 37, which has one of its ends fastened to the pin 32 by a set screw 38, its other end 39 being held by the housing 36. Grinding elements 40 and 41 are arranged inside of the housing, the grinding element 41 being resiliently mounted as indicated at 42, Fig. 11. The construction of the housing, its connection to the pin 32, and the construction and arrangement of the grinding elements 40 and 41 are set forth in full detail in Joseph Folk's co-pending application Serial No. 718,584, filed concurrently herewith. In the aforesaid co-pending application the housing and the sharpening mechanism are maintained normally in a predetermined position as regards the knife, the sharpening of the knife being effected by giving the housing a part turn. The sharpening of the knife by the present grinders or sharpeners 40 and 41 is effected in the same way set worth in the aforesaid application. In the present case, the housing including the pin 32, is normally in the position shown in Figs. 1 and 10, at which time the sharpeners will be removed from the knife 3. When it is desired to sharpen the knife, the pin 32 including the housing 36, is raised upwardly, preferably by lifting on the knob 43, until the pin 34 extends above and clears the upper end 44 of the knife supporting bracket 1, Figs. 9 and 10. The entire housing, including the pin 32, is then rotated 180° from the position shown in Fig. 10 to the position shown in Fig. 9, at which time the sharpeners 40 and 41 will be in exactly the same position as they are normally in the aforesaid co-pending application. However, before the sharpening mechanism can be rotated 180° from its initial position as shown in Fig. 10 to the position shown in Fig. 9, the guard 7 must first be swung on its pivot from the position shown in Fig. 1 to the dotted line position 30 shown in Fig. 2. As soon as the sharpening mechanism 28 is turned 180°, it is permitted to drop until the bottom of the casing engages a set screw 45 arranged in the knife bracket 1. In normal non-operative position, the housing 38 will assume the position shown in Fig. 10, at which time the bottom of the housing 36 will rest on the surface 46 of the supporting bracket, Fig. 1, the surface 46 being formed by cutting away a portion of the knife supporting bracket to provide a recess 47 into which the housing 36 is received. In this latter position, that is, in non-operating position, the set screw 45 will be received in an opening 48 formed in the bottom of the housing. Due to the inter-fitting relationship of the set screw 45 and the opening 48, it is impossible for the housing to shift or jar loose by vibrating or otherwise during operation of the machine. Normally the housing is shifted to the position shown in Fig. 10 with the sharpeners removed from the knife 3. Therefore, grease or other particles which may accumulate on the knife during slicing operations will not lodge on the sharpeners. The sharpeners are only brought into position when the knife is to be sharpened. When the knife is to be sharpened, the housing and its cooperating supporting pin 32 are raised until the pin 34 clears the top 44 of the bracket, and then swung 180°, at which time the housing is again lowered in position. The slot and pin construction 35 and 34 respectively prevents rotative movement of the pin 32. To sharpen the

knife, that is, to bring the sharpener into sharpening relationship with the knife, the housing 36 is manually given a part turn in the manner set forth in the aforesaid co-pending application.

The invention, therefore, comprises a knife guard which is free to be rotatively shifted to clear a portion of the knife when the grinding mechanism is brought into play. After the guard is shifted to bare a portion of the knife, the grinding mechanism is lifted a predetermined distance, then shifted 180°, and then lowered. In this latter shifted position, the housing is given a part turn and the sharpeners or grinding elements are brought into sharpening position with respect to the knife. After the knife sharpening operation has been completed, the sharpening mechanism is again lifted and rotated 180°, and then again lowered to its normal position as shown in Figs. 1 and 10. The invention provides means for practically completely guarding the entire knife as well as permitting sharpening of the knife without removing the guard. The invention also allows for the utmost in sanitation, as the sharpening elements are removed a considerable distance from the knife during the normal operation of the slicing machine. Therefore, no grease or substance which may be present on the knife due from cutting the substance will be thrown up into the sharpening mechanism housing. The only time the sharpener devices are in close proximity to the knife is when the housing is purposely shifted to perform a grinding operation. Many of the disadvantages inherent to slicing machines of the present type, therefore, have been overcome.

Changes may be made in the form, construction and arrangement of the parts without departing from the spirit of the invention or sacrificing any of the advantages thereof, and the right is hereby reserved to make all such changes as fairly fall within the scope of the following claims:

The invention is hereby claimed as follows:

1. In a slicing machine, a knife support bracket, a knife rotatably mounted on the bracket, an extension on said support bracket and forming a knife guard, said extension having a recess therein, and a knife sharpening mechanism casing pivoted in said bracket on one side of said knife and normally seating in said recess, and having sharpening mechanism extending therefrom in offset relation to the pivot of the casing, whereby the sharpening mechanism may be swung into and out of the plane of rotation of the knife, said sharpening mechanism casing when seated in said recess providing a guard for that portion of the said knife opposite the recess.

2. In a slicing machine, a knife support bracket, a knife carried by said brackets, an extension on said support bracket and forming a knife guard, said extension having a recess therein, a knife sharpening mechanism casing rotatably mounted in said bracket on one side of said knife and seating normally in said recess, and a sharpening mechanism extending therefrom in offset relation to the pivot of the casing, whereby the casing may be swung from its seating position into grinding position, said sharpening mechanism casing when seated in said recess forming a continuation of said guard portion of the bracket and acting as a knife guard.

3. In a slicing machine, a rotatable knife, a knife support bracket, an extension on said support bracket and forming a knife guard, said extension having a recess therein, a knife sharpening casing carried by said bracket on one side of said knife and normally seating in said recess, said sharpener casing when seated in said recess forming a continuation of said guard portion of the bracket and acting as a knife guard, means for mounting said sharpener casing on said bracket for vertical sliding and rotative movement in respect to said bracket for selectively positioning the casing in said recess or in proximity to the knife for sharpening operation.

4. A slicing machine comprising a suitable support, a rotatably mounted knife carried by the support, a flat faced removable guard plate for said knife and adapted to cover one face thereof, said plate being mounted to have a limited rotative movement, a knife shield integral with the plate and comprising a flange extending over the cutting edge of the knife, spaced pins carried by the support between which the flange extends to support and guide the plate, and means for clamping the flange to the supporting structure, said guard plate having a cut away portion adapted to receive grinding elements in grinding position.

5. In a slicing machine, a knife support bracket, a rotatable knife mounted on the bracket, a fixed knife guard having a recess therein extending from the bracket, a knife guard plate having a cut away portion mounted on the opposite side of the knife for rotative movement to position the cut away portion opposite the recess in the fixed knife guard, and a sharpening mechanism casing rotatably mounted in said bracket and adapted to seat in said recess to form a continuation of said fixed guard.

6. In a slicing machine, a supporting bracket, a knife rotatably mounted on said bracket, a knife guard having a marginal recess and extending from said bracket on one side of the knife, and a knife guard plate having a cut away portion mounted for rotative movement on the other side of the knife to position the cut away portion opposite the recess, and a sharpening mechanism casing rotatably mounted in the bracket to be positioned selectively in the said recess to form a part of the guard or in said cut away portion in grinding position.

7. In a slicing machine, a knife support bracket, a knife mounted on the bracket, an extension on said support bracket, said extension having a peripheral recess therein, knife sharpening mechanism housing pivotally mounted in said bracket on one side of said knife and normally seating in said recess and forming a guard for a part of the knife, and sharpening mechanism extending from said housing, said knife sharpening mechanism being offset from said pivot whereby said mechanism may be swung from its seating position into knife sharpening position.

8. In a slicing machine, a rotatable knife, a knife support bracket, an extension on said support bracket and forming a knife guard, said extension having a recess therein, a knife sharpener casing carried by said bracket on one side of said knife and normally seating in said recess, said sharpener casing when seated in said recess forming a continuation of said guard portion of the bracket and acting as a knife guard, a knife guard plate having a cut-out portion mounted on the other side of the knife, and flange extending over the cutting edge of the knife carried by the plate, said plate being mounted on said bracket for rotative movement in respect to said knife

whereby said guard plate may be shifted a predetermined distance to permit the sharpener casing to be swung into the cut-out portion and into sharpening position relative to the knife.

9. In a slicing machine, a rotatable knife, a knife support bracket, an extension on said support bracket and forming a knife guard, said extension having a recess therein, knife sharpening mechanism carried by said bracket on one side of said knife and seating in said recess, said sharpening mechanism when seated in said recess forming a continuation of said guard portion of the bracket and acting as a knife guard, means for slidingly mounting said sharpening mechanism in said bracket, means for swinging said sharpening mechanism approximately one hundred eighty degrees into knife sharpening position, a guard plate attached to the bracket and having a cut away portion, said plate being mounted on the other side of said knife and having rotative movement in respect thereto whereby said last named guard may be rotated to bare the knife at the cut away portion to permit said sharpening mechanism to be swung into sharpening position in respect to the knife, means for limiting the rotative movement of said guard, and means for locking the guard in its normal guarding position, said guard having rotatable movement when said locking means are released.

10. A slicing machine comprising a rotatably mounted knife, a flat faced removable guard plate for said knife, said guard plate having a cut-out portion to expose a part of the cutting edge of the knife and being adapted to be mounted to cover one face of the knife, an integral extension about an edge of the guard plate and extending over the cutting edge of the knife, means including a manually operated member for locking the guard plate in position in respect to said knife, means for supporting the knife, said locking means being releasable to permit rotative movement of said guard plate, and stop means for slidably supporting said extension and for limiting the extent of rotative movement of the guard plate and whereby varying parts of the cutting edge of the knife may be exposed.

11. A slicing machine comprising a supporting structure including a base and a bracket, a rotatably mounted knife carried by the bracket, a flat faced removable guard plate for said knife mounted for limited rotative movement and adapted to cover one face of the knife, a stud carried by the base and supporting the plate, a knife shield integral with the plate and having a flange extending over the knife to the opposite face thereof, and means for clamping the marginal portion of the guard plate to the supporting structure.

12. In a slicing machine, a knife support bracket, a knife rotatably mounted on the bracket, an extension on said support bracket and forming a knife guard, said extension having a cut-out forming a recess therein, knife sharpening mechanism including a casing carried by said bracket on one side of said knife and seating in said recess, said casing when seated in said recess forming a continuation of said guard portion of the bracket and acting as a knife guard, means for slidingly mounting said sharpening mechanism in said bracket, means permitting swinging movement of said sharpening mechanism about a vertical axis of approximately one hundred eighty degrees into knife sharpening position, and a guard plate concentrically mounted on the other side of said knife, and a guard for a part of the knife carried by the guard plate, said plate having means for mounting said plate and guard on said bracket for rotative movement in respect to the knife whereby said last named guard may be moved a predetermined distance to bare said knife to permit the mechanism to be swung into sharpening position relative to the knife.

ARTHUR H. AHRNDT.
JOSEPH FOLK.