Dec. 22, 1936. E. G. STRECKFUSS 2,065,352

SLICING MACHINE

Filed Oct. 9, 1931 4 Sheets-Sheet 1

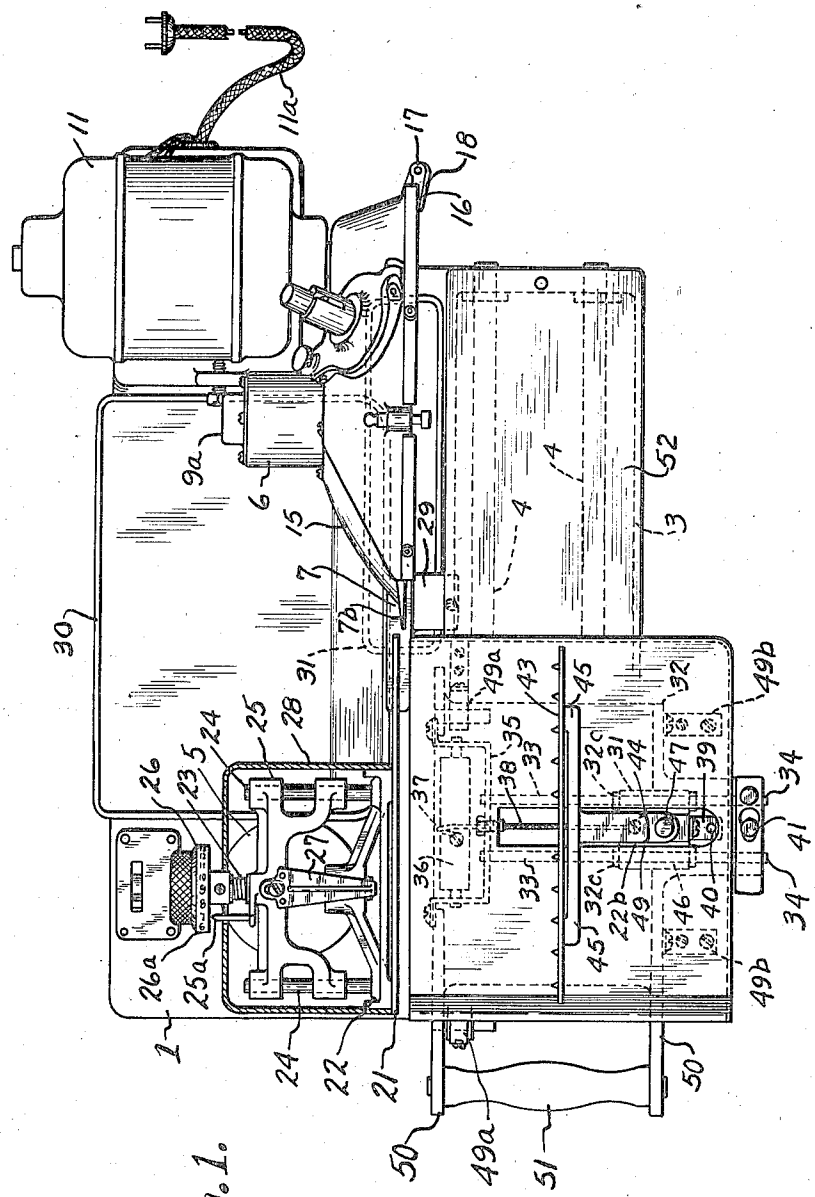


Fig. 1.

INVENTOR.
Elmer G. Streckfuss
BY Allen & Allen
ATTORNEYS

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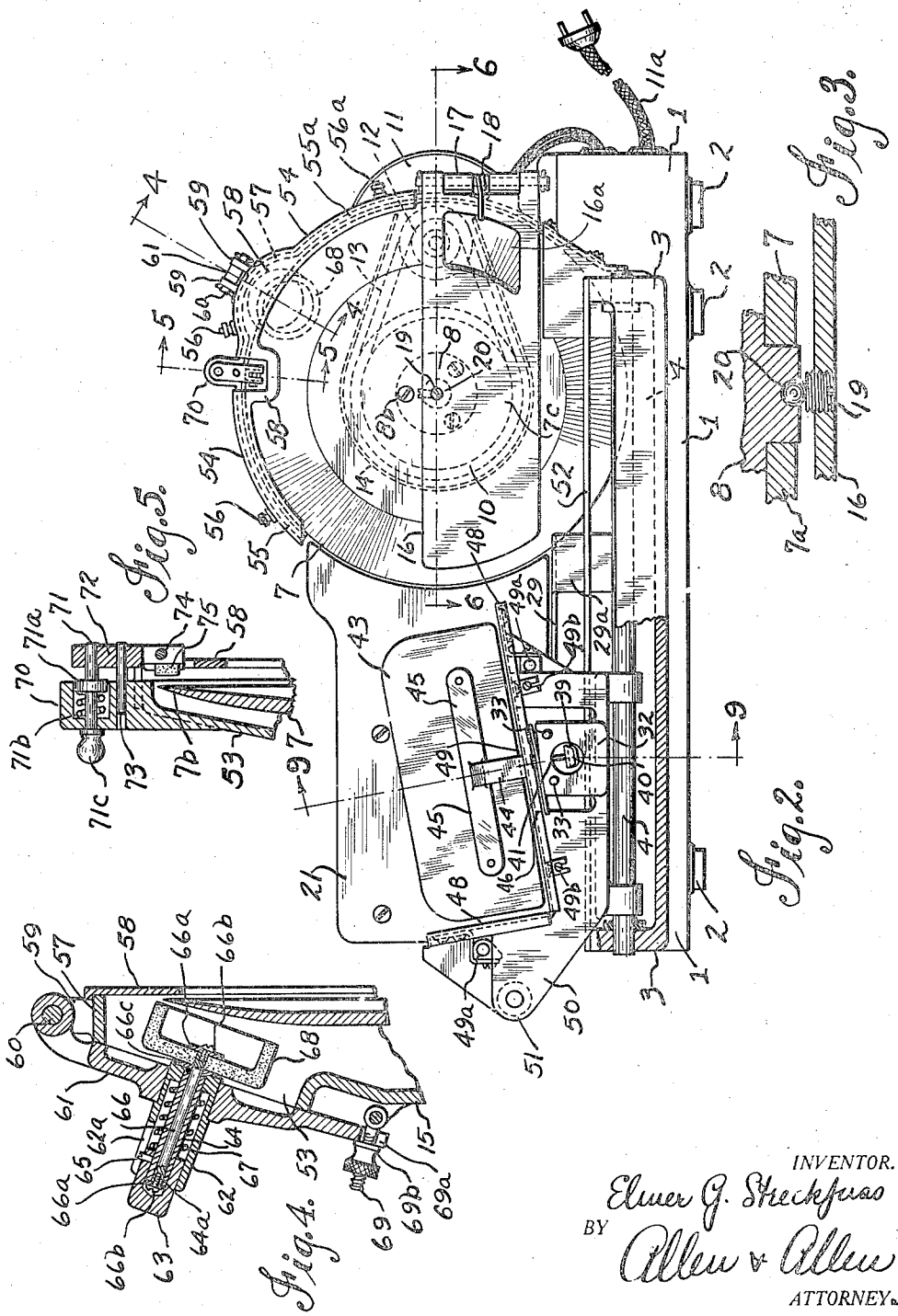


Fig. 2.

Fig. 3.

Fig. 5.

Fig. 4.

INVENTOR.
Elmer G. Streckfuss
BY
Allen & Allen
ATTORNEYS.

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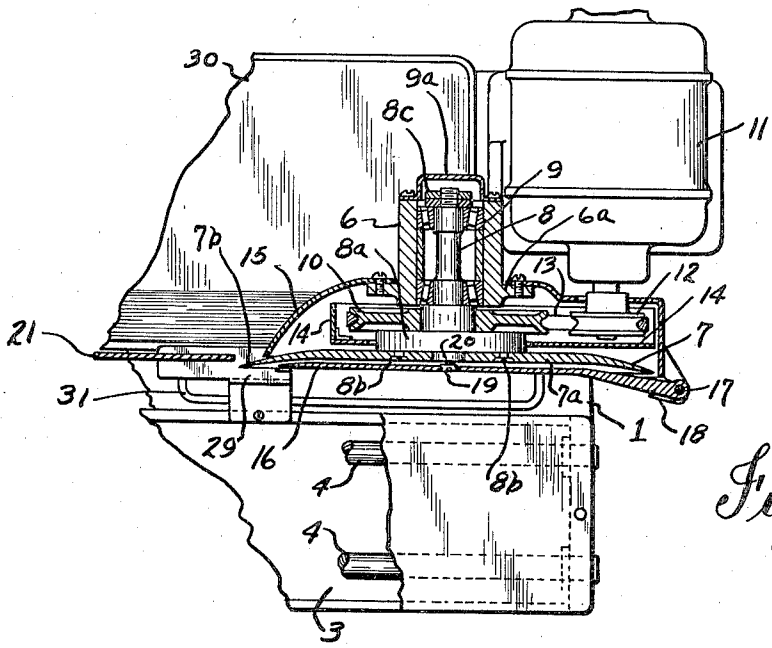


Fig. 6.

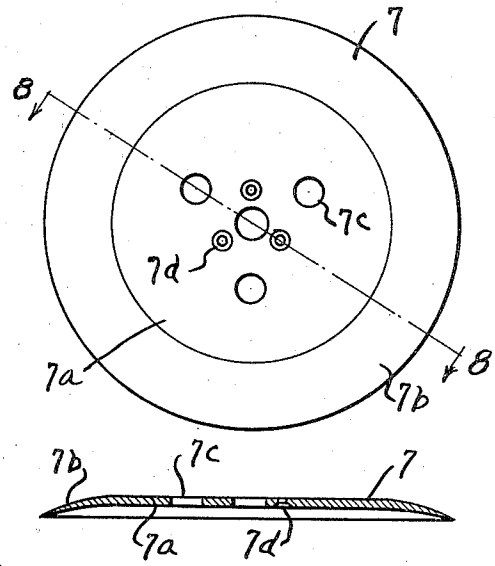


Fig. 7.

Fig. 8.

INVENTOR.
Elmer G. Streckfuss
BY
Allen & Allen
ATTORNEYS.

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Fig. 9.

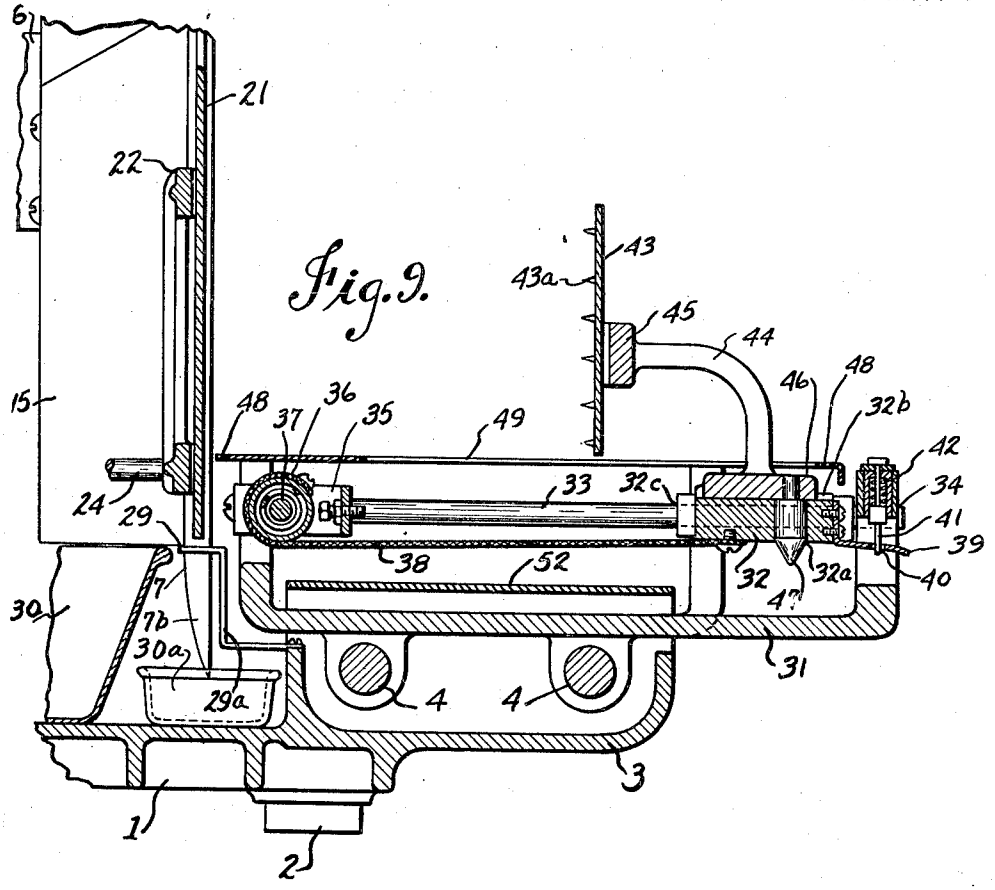
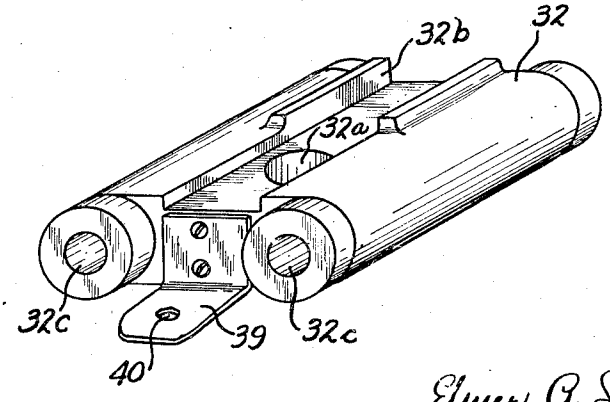


Fig. 10.



INVENTOR.
Elmer G. Streckfuss
BY
Allen & Allen
ATTORNEYS

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2,065,352

UNITED STATES PATENT OFFICE

2,065,352

SLICING MACHINE

Elmer G. Streckfuss, Cincinnati, Ohio, assignor to The Cincinnati Time Recorder Company, Cincinnati, Ohio, a corporation of Ohio

Application October 9, 1931, Serial No. 567,921

5 Claims. (Cl. 146—102)

My invention relates to slicing machines, and more particularly to such machines for slicing meat and similar materials.

As exemplified herein, my invention is embodied in that type of slicing machine in which a rotary cutting disc has the material fed to it on a carriage with the thickness of the slice gauged by a slice-adjusting plate set so as to have its advanced edge close to the cutting edge of the disc, and so that this plate will face the carriage when the carriage is withdrawn from slicing position.

One of the objects of my invention is to minimize the clogging of the particles of the material being sliced at the face of the cutting disc, and thereby to avoid the unsanitary conditions resulting from such clogging, as well as the excessive friction set up thereby.

A further object is to carry out the above object by means which will permit ready access to the cutting disc for cleaning, and which, when adjusted to operating position, will be held in such position partly by the rotary operating means for the cutting disc with a minimum of friction.

A further object is to provide a carriage together with its means for advancing the material toward the slice-adjusting plate after each cut is made, which carriage and said means will be of comparatively simple construction, reliable and easy to keep in proper working condition, and easy to keep clean. Together with this object, it is my object to have such means that advance the material toward the slice-adjusting plate automatic in its action, with all of the advantages of simplicity, reliability and said sanitation just mentioned.

It is a further object of my invention to provide in conjunction with the improved means associated with the cutting disc, a grinder for the edge of the disc which may be very readily adjusted into or out of operating position; and also to provide in conjunction with these parts a whetting device which may be readily adjusted into position for removing the burr from the cutting disc edge after grinding with said grinding device, and which may be readily adjusted out of position.

Also it is my object to provide the entire machine of comparatively simple construction and convenient arrangement in the interest of ease of operation, as well as of keeping the machine in proper operative and sanitary condition.

Other objects auxiliary to or in addition to the objects above set forth will appear in the course of the following description, in which, together with the accompanying drawings, I have set forth a preferred example of my invention.

In the drawings:—

Figure 1 is a plan view of the machine.

Fig. 2 is a front elevation of the same.

Fig. 3 is a partial horizontal cross section illustrating the bearing between the deflector plate and the disc shaft.

Fig. 4 is a partial front to rear section of the disc housing and disc showing the disc grinding device.

Fig. 5 is a similar view showing the disc-whetting device.

Fig. 6 is a partial horizontal cross section on the plane of the line 6—6 of Fig. 2.

Fig. 7 is a detail front elevation of the cutting disc, and Fig. 8 is a cross section on the plane of the line 8, 8 of Fig. 7.

Fig. 9 is a partial front to rear section on the plane of the broken line 9, 9 of Fig. 2.

Fig. 10 is a detail perspective view of the pusher or cross feed bed.

As my invention is exemplified herein, the base 1 comprises a middle rear part with extensions at opposite ends, has feet 2, and has a forward longitudinal trough-shaped extension 3 in which the carriage guide rods 4 are contained, running longitudinally of the machine and of this trough-shaped extension 3, with their end parts fixed in the ends of said extension 3. On the left hand extension of the rear part of the bed 1 is the pedestal 5 for supporting the slice-adjusting plate mechanism, as later will be described; and near the right-hand end of the middle part of this base there is the upstanding bearing post 6, which, as seen in Fig. 6, has a forward extension with an annular flange 6a.

The knife or cutting disc 7 has a plane central part 7a, from which its peripheral part 7b curves forwardly in its annular extent and gradually becomes thinner out to the sharp cutting edge; the disc 7 thus being in the form of a very shallow dish with a wide, flat bottom. This plane or flat bottom central part 7a has a series of openings 7c shown in Figs. 7 and 8, spaced out from its center and has nearer its center a series of screw openings 7d, while at its center it has an opening which receives the reduced front end part of the shaft 8, which has immediately to the rear of this end part a flange 8a of ample diameter to receive the screws 8b through the opening 7d; thus fixing the disc to the shaft. The rear end part of the shaft is reduced and threaded to receive end thrust nuts 8c, by means

of which the shaft 8 is held to run freely in its bearings 9 in the bearing post 6; these bearings preferably being conical roller bearings, as shown clearly in Fig. 6. Between the large flange 8a and these bearings this shaft 8 has an enlargement which takes the rearward end thrust, while the nuts 8c before mentioned take the forward end thrust. The rear end of the bearing opening in the bearing post 6 is closed by a cap 9a.

On the enlargement between the shaft disc 8a and the bearings 9 the grooved pulley 10 is fixed; and on the right hand extension of the rear part of the bed 1 the motor 11 is mounted, having fixed on its forwardly extending shaft the grooved pulley 12. An endless belt 13 passes around the two pulleys 10 and 12. The motor receives current through a flexible cord 11a. This belt and pulley arrangement by which the motor 11 drives the disc 7 preferably is enclosed by a rearwardly opening guard casing 14.

Fastened to the flanges 6a of the bearing post 6 is the rear deflector casing, which at the right has an aperture through which the motor shaft is admitted; and extending forward and enclosing the right hand end of the inner casing 14, as well as the disc 7, this casing 15 surrounds these parts throughout about the left hand semi-circular area of the disc 7. At the left, however, the wall of this casing 15 inclines forward and to the left with a slight curvature of cross section so that it forms a rear deflector; its forward edge being very close to the rear side of the disc 7 some distance radially inwardly from the sharp edge of the disc.

On the front edge of the right hand part of the casing 15 just described the front deflector plate 16 has a hinge 17, on which it may swing back to the disc 7 or forwardly away therefrom in a horizontal plane. A spring 18 is mounted so as to act torsionally to normally keep this deflector plate back within the dish of the disc 7, as very clearly seen in Fig. 6; in which position its front surface does not extend materially past the forward sharp edge of the disc. When so held back, its screw 19 bears against a ball 20 held in a socket in the front end of the disc shaft 8. This screw and this ball thus form the means for limiting the inward movement of this plate 16 under the action of the spring 18; and as the screw 19 may be adjusted in the plate 16 the limit of this inward movement may be adjusted. The plate 16 is cut away at 16a in that part of the plate which is bent, thus affording movement of low pieces of meat without interference of the bent portion, as clearly shown in Fig. 2. The slice-adjusting plate 21 is held vertical with its right hand edge formed substantially concentric with the disc 7 and coming very close to the sharp edge thereof. It is mounted on a yoke 22, in the middle of which is journaled a screw 23, while support rods 24 extend rearward at both sides and slide in bearings in a yoke 25 upstanding from the pedestal 5; the screw 23 being threaded through the middle part of this yoke. A pointer 25a is carried on a radial extension of the hub where the screw 23 is threaded through the yoke 25 and the screw 23 has a head 26 with an annular surface which bears indicia 26a, to which the pointer 25a may refer as a means for accurately setting the slice-adjusting plate 21 forward or backward with relation to the edge of the disc 7 for cutting thinner or thicker slices, as may be desired. A plate 27 is mounted on top of the hub of the supporting yoke 25 and has a down-turned lug on its front end, limiting the forward movement of the slice-adjusting plate 21. The mechanism just described preferably is surrounded by a casing 28, having in its rear side suitable openings through which extend the threaded shaft 23 and the pointer 25a so that the knob 26 is on the outside of the casing.

Below the left end of the slice-adjusting plate the reaction plate 29 extends horizontally very close to the edge of the disc 7 and closely under the lower edge of the slice-adjusting plate 21, being supported by an L-shaped part 29a which joins part of its forward edge with the bottom of the L-shaped part extending forward and screwed to the rear edge of the trough-shaped extension 3 of the base 1.

In the middle of the rear part of the base the slice tray 30 is set to receive the slices as they are deflected rearward by the deflector housing 15; and under the disc 7 is the smaller scrap tray 30a which is in position to receive scraps of the sliced material coming either from the reaction plate 29 or from the front deflector plate 16.

The carriage 31 comprises the long right hand substantially trough-shaped part with depending lugs embracing the guide rods 4 of the bed 1 upon which rods it is freely slidable longitudinally of the machine; and also comprises a left hand upward extension. The pusher device for pushing the material toward the slice-adjusting plate 21 comprises the bed 32, which is shown in detail in Fig. 10 as having a central socket 32a down through it within a longitudinal groove 32b, on opposite sides of which it has rod bearing openings 32c through it parallel with each other and with the groove 32b. Guide rods 33 pass through the openings 32c and have their forward ends fixed at 34 in the front wall of the carriage 31, while their rear ends are screwed to a wide U-shaped member 35 with its sides extending rearward and forming bearings for the opposite ends of a feed driving drum 36 inside of which there is a torsional spring 37 so engaging this U-shaped member 35 and the drum 36 as to cause the drum to rotate over forwardly and be wound around the drum a cable 38, which has its forward end fixed to the bottom of the pusher bed 32, which thus will be pulled backward unless held forward by means of a resilient tongue extending forwardly and downwardly from its front end and having a detent opening 40 into which rides a detent pin 41 under the downward pressure of a spring 42 held in the upper part of the front wall of the carriage 31; this wall being apertured below this part to admit the tongue 39 in the position in which it is engaged by the detent pin 41 to hold the pusher device forward.

The pusher plate 43 is vertical, with rearwardly extending spurs 43a; and about midway of its height a support 44 has right and left arms 45, to which this plate 43 is fixed. This support 44 curves down at the front and joints its base 46, which fits snugly in the groove 32b of the pusher bed 32 while a stud 47 fixed in and extending downward from the support base 46 snugly fits in the socket 32a in this bed 32. The surface plate 48, which is the actual surface upon which the material rests, is secured on the upper edges of the walls of the carriage 31 extending rearwardly close to the adjusting plate 21 and cutting disc 7, and extending forwardly past the forwardmost limit of travel of the pusher support 44; having a front to rear slot 49

up through which this support 44 extends and in which it may slide. This surface plate 48 is secured to the carriage bed 31 as just mentioned preferably by upper right and left hand clips 49*a*, and bottom right and left hand clips 49*b*, as shown in Fig. 2; and its left part extends up at right angles to its main part as a backing for the material. This entire structure, including the pusher device, preferably inclines somewhat downwardly to the left as is well known in the art for more efficient holding of the material by the carriage. This carriage has a pair of arms 50 extending to the left, between which is fastened the handle 51 grasped by the operator for manually feeding the carriage in right hand cutting direction and drawing it back to the left. The trough-shaped part 3 of the bed 1 preferably has a cover plate 52 fastened to the ends of the trough which extend higher than the sides; this plate 52 extending through the carriage 31 without interfering therewith.

The rear deflector casing 15 has in its upper part somewhat to the right of its middle, an opening 53, and extending in both directions from this upper part it has segmental guards 54 overlying and extending slightly inwardly across the front part of the cutting disc 7. These guard extensions 54 have inside them over the edge of the cutting disc 7 segmental extensible guard members 55 and 55*a*, respectively, which may be held in adjusted position by screws 56 and 56*a*, respectively.

Over this opening 53 the casing 15 has an upwardly extended enlargement 57, the front of which is closed by a plate 58. On the top of this extension 57 is a pair of upstanding hinge lugs 59 through which is a pin 60, on which is hung the rear plate 61 which closes the opening 53. This plate 61 has near its center an opening in which is fixed a rearwardly extending deep cup-shaped casing 62 with its open end at the rear and having slidable therein the rear bearing 63, which also is cup-shaped with its opening forward inwardly of the casing 62 to receive the rear end part of the inner tube 64 which extends forwardly through the bottom of the casing 62. This tube 64 is fixed in the rear bearing 63 by a set screw 65, which extends radially out into a longitudinal slot 62*a* in the casing 62. The grinding wheel shaft 66 is journaled in this inner tube 64. A helical spring 67 surrounds this tube and is compressed between the bottom of the casing 62 and the rear bearing member 63. This shaft 66 extends forward where it carries the cup-shaped grinding wheel 68. The front and rear ends of the shaft 66 have washers 66*a* secured to them by screws 66*b*; the rear washer abutting the rear end of the inner tube 64 and the front washer being against the grinding wheel 68. A washer 66*c* is interposed between the back of the grinding wheel and the front end of the tube 54. The lower end of the plate 61, which thus carries the grinding wheel 68, is clamped to the casing 15 by a shackle 69 pivoted to the casing and swinging up into a slot 69*a* in the bottom of the plate 61, while the outer end part of this shackle 69 has screwed on it the nut 69*b* which clamps the plate 61 in closed position.

At its top the casing 15 has a smaller hollow, forwardly-opening enlargement 70 and a rod 71 is slidable from front to rear therein, with a collar 71*a* fixed on it. A helical spring 71*b* surrounds the rod 71 and is compressed between the collar 71*a* and the back of the interior of the enlargement 70; the rod 71 having on its rear end outside the enlargement 70, a knob 71*c*. The front end part of the rod 71 has fixed on it the yoke 72 extending downward and having fixed in it a guide stud 73 extending backward and slidably fitting in an opening through the upward extension 70, as is clearly shown in Fig. 5. The lower end of this yoke 72 is divided into two parts which may be drawn together by a screw 74 passing transversely through the parts; and the rear edges of these parts are grooved to form jaws receiving between them the whetting member 75.

The principle of operation of the grinding wheel 68 and of the whetting member 75 is the same. The grinding wheel 68 is so located and inclined that its upper segment is adapted to contact with the rear side of the sharp peripheral part of the cutting disc 7 when the wheel is pressed forward by pressure of the hand on the rear bearing member 63. The whetting member 75 is located in front of the periphery of the cutting disc 7, so that a backward pull on the knob 71*c* brings the whetting member 75 against the front side of the sharp periphery of the cutting disc 7. Thus the grinding wheel 68 is used to sharpen the disc, and then the whetting member 75 may be used to remove whatever burr remains after the sharpening; so that a very smooth and keen edge thus may be formed on the cutting disc 7.

It will be noted, as clearly shown in Fig. 2, that the front deflector plate 16 covers only a fractional part of the front of the cutting disc 7 while fitting back in the dish of this disc. This construction is different from prior constructions so far as I am aware. Such prior constructions are designed to practically completely fill the dish of the disc, and are built stationarily into the structure. The result of this prior construction in practice has been that particles of materials, such as meat, accumulate behind such a plate between it and the disc, causing excessive friction and because of the inconvenience of separating the parts for cleaning such accumulation of particles soon causes a very unsanitary condition.

I confine the extent of my front deflector plate to just that part of the cutting disc where such a plate is needed; that is, for some distance up past the plane of the bottom of the carriage that brings the material to be cut and down close to the plane of the reaction plate 29. Also by mounting this plate 16 so that it is readily separable from the cutting disc 7, it is easy to remove the particles of material and to clean the cutting disc and the rear surface of the deflector plate 16. This plate 16 is especially convenient to move away from the disc 7 when hinged as by the hinge 17; and the convenience of removal and replacement is greatly increased when the plate is held in operative position yieldingly as by the spring 18. Its adjustment relative to the disc 7 is especially convenient by means of the screw 19; and since it is necessary to limit the extension of the plate 16 short of the periphery of the disc 7 at the left or receiving end the bearing of the adjusting screw 19 at the center of the disc shaft affords a very simple means for coaction with the screw 19 in this adjustment, and the provision of the ball bearing 20 allows this arrangement without appreciable increase of friction on the cutting disc.

From a description of the mounting of the slice-adjusting plate 21, it will be understood that this plate may be very accurately adjusted for thickness of slice; the thickness being deter-

mined by the distance of the front surface of this plate 21 to the rear of the sharp edge of the cutting disc 7. I have provided to act in conjunction with the plate 21 a very simple and effective automatic cross feed or pusher device such as the example which I have described. As shown therein, the spring-actuated feed drum 36, winding up the cable 38, will automatically push the material back against the plate 21 after each cut; so that once the plate 21 is adjusted for thickness of slice this thickness will accurately be maintained on account of this automatic backward feeding action and the operator needs only to reciprocate the carriage by grasping the handle 52. When the pusher device is at its most outward or forward position the automatic feeding is prevented by the engagement between the detent 41 and the tongue 39; thus permitting the material to be put in place on the carriage and pushed forward onto the prongs 43a of the pusher plate 43. When the material thus has been set in position ready to begin slicing it is very easy to release the device for automatic operation by raising the detent 41. This forward locking action is automatically effected when the pusher device is brought forward because the downwardly sloped end of the tongue 39 rides under and lifts the detent 41 to automatically enter the tongue opening 40 under pressure of its spring 42.

It will be noted that the clips 49a and 49b which hold the surface plate 48 to the carriage, are slotted so that mere loosening of the screws which hold them permits the surface plate 48 readily to be lifted off the carriage upon which all of the underlying parts and mechanism are completely accessible for cleaning, as well as permitting the surface plate itself to be thoroughly cleaned.

I have somewhat specifically described a preferred embodiment of my invention, but it will be understood that various modifications may occur in practice within the scope of my invention, and therefore that I am not limited to such precise disclosure, but what I claim as new and desire to secure by Letters Patent, is:—

1. In a slicing machine comprising a cutting disc rotatable in an upright plane and means for feeding material across the front face of the disc, cutting a slice to pass to the back of the disc, a guard and guide plate hinged to said machine near one edge of the disc and extending across said face along the path of the fed material, with opposite edges receding from the disc periphery along said path, and with a bearing at the center of the disc, and means acting on said plate near its hinge to hold the plate to said bearing, said means being movable to allow the plate to swing on its hinge away from said disc.

2. In a slicing machine comprising a cutting disc rotatable in an upright plane and means for feeding material across the front face of the disc, cutting a slice to pass to the back of the disc, a guard and guide plate hinged to said machine near one edge of the disc and extending across said face along the path of the fed material, with opposite edges receding from the disc periphery along said path, means at the center of the disc, adjustable to variously space the plate from the face of the disc, and a spring acting on said plate near its hinge, yieldingly holding said plate toward the disc, in the spaced relation thereto established by the adjustable spacing means at the center of the disc.

3. In a slicing machine comprising a cutting disc rotatable in an upright plane and means for feeding material across the front face of the disc, cutting a slice to pass to the back of the disc, said disc having a central part rotating therewith at said face, a guard and guide plate having a mounting near one edge of the disc by which it is held toward the face of the disc, a screw threaded through said plate at said central part of the disc, and an anti-friction bearing between said screw and said central part, said screw and said mounting coacting to hold the plate various distances from the face of the disc as determined by turning said screw.

4. In a meat slicer, a rotary knife, means for feeding the product to be cut along the face of the knife for slicing the same, said knife extending parallel to the direction of said feed, and having a recessed face whereby the meat when sliced will not engage the major portion of the face of the knife, unless moved beyond the slicing plane, and a deflector to prevent such movement of the meat comprising a plate covering the lower portion only of the face of the knife, and lying within the recessed portion, and in the path of movement of the fed product, said plate bent to extend over the cutting edge of the knife at its end away from the slicing point, and a portion cut out between the marginal limits of that part of said plate which is so bent, said cut out portion being thereby disposed in the path of movement of pieces of meat being fed.

5. In a meat slicer, a rotary knife, means for feeding the product to be cut along the face of the knife for slicing the same, said knife extending parallel to the direction of said feed, and having a recessed face whereby the meat when sliced will not engage the major portion of the face of the knife, unless moved beyond the slicing plane, and a deflector to prevent such movement of the meat comprising a plate covering the lower portion only of the face of the knife, and lying within the recessed portion, and in the path of movement of the fed product, said plate bent to extend over the cutting edge of the knife at its end away from the slicing point, and hingedly mounted at said end for movement toward and from the knife, means normally functioning to hold said plate in proximity to the knife, and abutment means effective to limit movement of the plate toward the knife, said plate having a portion cut out in that part of said plate which is so bent, said cut out portion being thereby disposed in the path of movement of pieces of meat being fed.

ELMER G. STRECKFUSS.