Dec. 17, 1935. F. T. LAMBERT 2,024,933

SLICING MACHINE

Filed May 28, 1934 3 Sheets-Sheet 1

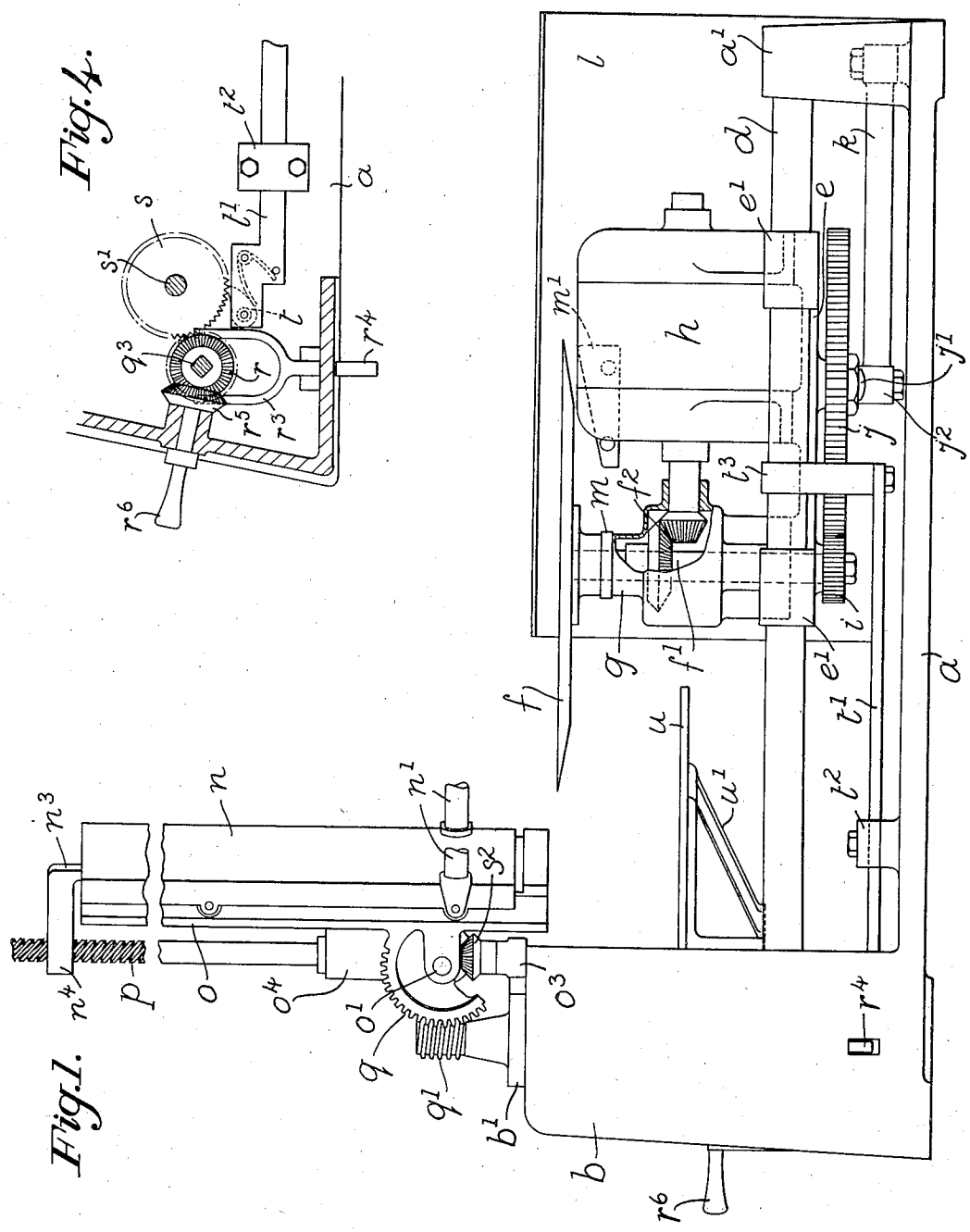

Fig. 1.

Fig. 4.

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Fig. 2.

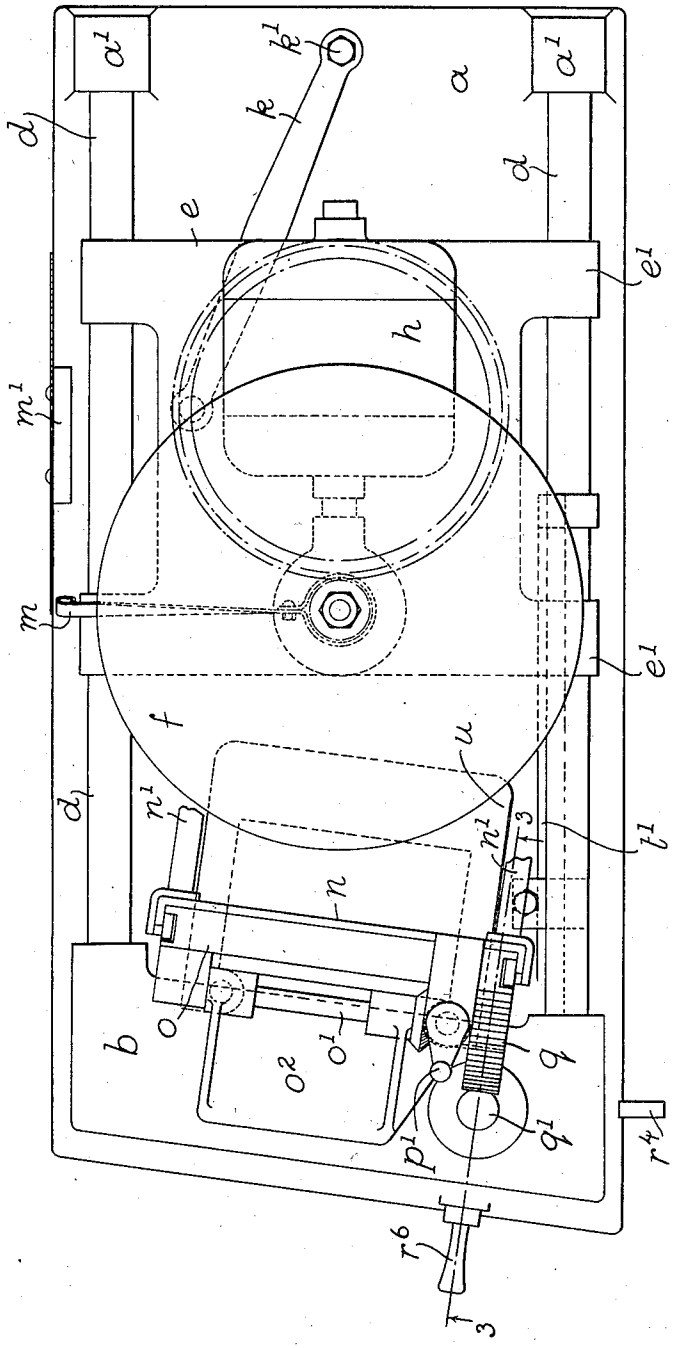

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Fig. 5.

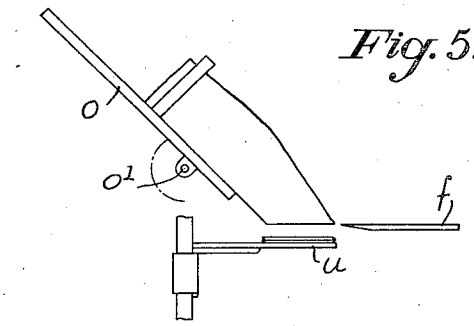

Fig. 3.

Fig. 6.

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UNITED STATES PATENT OFFICE

2,024,933

SLICING MACHINE

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Application May 28, 1934, Serial No. 727,998
In Great Britain May 31, 1933

2 Claims. (Cl. 146—105)

This invention relates to slicing machines for bacon and other substances.

My invention has for its main object to provide an improved slicing machine in which the substance can be cut either perpendicularly through the thickness or else obliquely thereto and therefore to an increased width as compared with the actual thickness of the piece; this is particularly advantageous in slicing thin pieces of streaky bacon, the narrow rashers obtained by the ordinary method of cutting having a considerably lower selling price or being less in demand than wider rashers cut from the thicker part of the same substance.

Another object of my invention is to provide an improved arrangement of slicing machine, in which the slices are cut from the lower end of a length of substance occupying an approximately vertical position, preferably adjustable to an inclined position to allow of the oblique slicing of a thin part and brought back to the vertical for the normal slicing of a thicker part.

A further object of my invention is to provide an improved slicing machine in which the angular position of an approximately vertical length of substance, sliced by a horizontal cutting knife at its lower end, is adjusted in conjunction with the feed movement which advances the piece downwards towards the cutting plane after each slice has been cut.

Other objects of my invention will appear from the description given hereafter with reference to the accompanying drawings, which illustrate a preferred embodiment of my improved slicing machine, and in which:—

Fig. 1 is a front elevation of the machine, with the cover partly broken away.

Fig. 2 is a plan view.

Fig. 3 is a part sectional elevation, seen on the line 3—3 of Fig. 2.

Fig. 4 is a plan view of a detail in the feed mechanism.

Figs. 5 and 6 are diagrams illustrating the oblique and perpendicular cutting effected by my invention.

Referring to Figs. 1 to 4, the slicing machine comprises a base a, having at one end a head b and at the other end a pair of lugs a^1, with a pair of parallel rails d extending horizontally from the head into the lugs. These rails form guides for a slide e having four eyes e^1 fitting in pairs upon the two rails. The slide carries a rotary disc knife f mounted upon a vertical shaft f^1 journaled in a support g and driven by a bevel reducing gear f^2 from an electric motor h secured upon the slide. The shaft f^1 extends through the slide and its lower end is fitted with a pinion i meshing with a gear wheel j rotatably mounted on a stud j^1 beneath the slide. The gear wheel j forms a crank disc, being provided with a crank pin j^2 engaged by one end of a link k, the other end of which is mounted upon a fixed pivot k^1 on the center line of the base. Thus the rotation of the motor h will drive the knife f, at half speed for example, and will also revolve the crank pin j^2, at one-tenth speed for example; the slide will therefore reciprocate at slow speed along the rails d, causing the rotating knife f to move to and fro in a horizontal plane just below the top of the head b. A detachable cover plate l, secured to the edges of the base, encloses the motor and gearing, but allows the knife to project at one side as it approaches the head; during the return movement, a scraper m consisting of a steel strip having one end clamped around the knife support g, is brought into contact with the revolving knife by means of an adjustable cam m^1 secured on the inside of the cover plate l, the contact lasting for a short period sufficient to remove any fat or particles adhering to the surface.

The substance to be sliced is mounted upon a meat plate or holder n having a pair of pillars n^1 and a clamping bar n^2 of the known kind, this meat plate being slidable upon a backing table or support o under the control of a feed screw p fitted with a handle p^1; a cranked arm n^3 secured to the plate n is formed as a nut at its extremity n^4 to engage the screw p. The table o is mounted upon a hinge at o^1 at the top of a bracket o^2 secured on the head b; this hinge o^1, which is set obliquely to the rails d, as seen in Fig. 2, allows the table to be turned from the vertical position shown in Figs. 1, 2 and 3 into the horizontal position indicated in dotted lines in Fig. 3 in order to facilitate the mounting of the substance; after the piece has been clamped in place on the meat plate or holder n by the bar n^2, the table is turned down again and secured in the proper position for cutting.

The movement of the table about its hinge o^1 is controlled by a toothed segment q, shown as formed integral with one edge of the table, this segment meshing with a worm q^1 upon a vertical shaft q^2 rotatably mounted in a socket b^1 secured upon the top of the head b by screws b^2 passing up through an interior washer plate b^3; the lower end of this shaft q^2 is squared at q^3 and the extremity is journaled in a boss a^2 in the base of the machine. Upon the squared portion

q^3 of the shaft, there is slidably mounted a gear sleeve comprising a bevel wheel r and a spur wheel r^1 with an intermediate grooved portion r^2 engaged by a striking fork r^3; by means of an external handle r^4 the fork can be operated to lift the gear sleeve until the bevel wheel r comes into mesh with a second bevel wheel r^5 rotatably mounted in the wall of the head b and operated by an external handle r^6. By turning the handle, while the bevel wheels are in mesh, the worm q^1 can be caused to rock the table o about its hinge so as to obtain the horizontal position or any desired inclination to the vertical.

When the gear sleeve occupies its lower position, as shown in Fig. 3, the spur wheel r^1 meshes with a second spur wheel s fitted upon the squared lower end of a vertical shaft s^1 having its lower extremity journaled in a second boss a^3 in the base of the machine; the upper end of this shaft is journaled in a lateral extension o^3 of the bracket o^2 and its extremity carries a bevel pinion s^2 meshing with a bevel wheel s^3 rotatably mounted upon the hinge pin o^1, this bevel wheel being also in mesh with a second bevel pinion p^2 at the lower end of the feed screw p, which is rotatably supported in a boss o^4 on the back of the table o. Thus the feed screw can be operated irrespective of the angular position of the table, by the rotation of the shaft s^1, the movement being reversed by the bevel gearing $s^2s^3p^2$. The automatic feed motion is produced by a pawl t engaging the spur wheel s, Fig. 4, this pawl being mounted upon a slide rod t^1 guided by a saddle t^2 on the base of the machine; the other end of the rod is secured to a tappet t^3 slidably mounted upon one of the rails d between the two eyes e^1, the alternate engagement of which with the tappet t^3 as the slide e reciprocates along the rails, causes the pawl-fitted rod t^1 to rotate the spur wheel s and shaft s^1 and then to return to its former position. The forward rotation of the shaft s^1 operates the feed screw p through the bevel gearing $s^2s^3p^2$, lowering the meat plate n to the extent of the thickness of a slice; at the same time, the spur wheel s rotates the wheel r^1, provided the gear sleeve is in its lower position, thereby producing a small angular movement of the table o about its hinge, by the operation of the worm q^1 and segment q.

Below the meat plate and its supporting table, there is provided a flat plate u fixed upon a bracket u^1 having a pair of lugs u^2 which fit respectively upon the vertical shaft s^1 and upon a fixed vertical guide rod arranged in a symmetrical position towards the other side of the bracket. The plate u, which is intended to receive the slices cut from the lower end of the substance clamped on the meat plate n, can thus slide vertically upon its guides; its movement is controlled by means of a half-nut u^3 engaging with screw threads s^4 formed on the shaft s^1, this half-nut being hinged upon the corresponding lug u^2 so that it can be turned aside out of engagement with the screw threads to allow vertical adjustment of the plate u, but is normally kept in engagement with the threads by a spring or catch. When so engaged, the half-nut causes the plate u to descend at the same rate as the meat plate u, thus keeping the stack of slices clear of the knife f.

In cutting a piece of bacon of full thickness, the table o may be turned up into the vertical position and the slices cut perpendicularly through the thickness, the gear sleeve rr^1 being held in the raised position so that the worm q^1 is not driven; in cutting a piece of uniformly narrow bacon, the table may be adjusted to a suitable inclination, for example 45 degrees, and the slices cut obliquely through the thickness, so that they are of considerably greater width than the actual thickness of the piece, the worm q^1 being likewise disconnected from the feed mechanism.

When however the thickness of the piece varies from one end to the other, the inclination of the table is gradually altered so that slices of equal width are obtained from both the thin and the thick parts, the former being sliced obliquely, as indicated in Fig. 5, and the thicker part perpendicularly, as indicated in Fig. 6. The initial cut may be taken with the table o inclined at 45 degrees, for example. when slicing the thinner end, and the meat plate or holder n may then be fed downwards at this same inclination for the first few slices, after which, as soon as the thickness begins to increase, the gear sleeve rr^1 is lowered by the handle r^4, and the inclination is then gradually reduced by the operation of the worm q^1 as the slicing proceeds, until the table comes into the vertical position for the thicker end of the piece, as illustrated in Fig. 6. The angular movement of the table produced by the worm q^1 is thus controlled in conjunction with the feed mechanism, so that as the substance descends after each cut, the table o also turns through a suitable angle about its hinge, either after each cut or (by manipulation of the handle r^4) after a given number of cuts, until it reaches the vertical position, whereafter the slicing continues in the normal way by cutting perpendicularly through the thickness of the piece. The worm q^1 may be disconnected automatically from the drive as soon as the table comes into the vertical position, by means of a bell crank (not shown) struck by the lower edge of the table o and acting to lift the gear sleeve rr^1.

The hinge o^1 for the table or support may be located at a relatively short distance above the plane of the cutting knife f, so that without an inconveniently long to-and-fro movement, the knife will be able to slice the substance in any angular position to which the table may be usefully adjusted. The surface of the table, as seen in Figs. 1 and 2, is oblique to the line of the to-and-fro movement of the knife, so that the slice is severed at one end first and thus caused to fall clear of the knife; this obliquity is obtained by setting the table surface and the hinge o^1 at the same angle to the line of movement, in order that the two bottom corners of the table shall have equal clearance above the knife f in any angular position of the table about its hinge, thus allowing the lower end of the table to support the substance close to the plane of the cut, and across the whole length of the slice, while maintaining the table clear of the knife.

The knife support may be operated by a hand wheel or lever for example, instead of by the gearing above described, and it may oscillate around a fixed pole or pivot; the knife may be driven by an electric motor as described or in any other convenient manner.

What I claim is:—

1. A slicing machine comprising a rotary knife, a support for said knife, means for moving said support to and fro with said knife in a horizontal cutting plane, a support for the substance to be sliced by said knife, means for feeding said substance down towards said cutting plane, a slice

receiver mounted below said support, means for adjusting said support from a horizontal to a vertical position about a horizontal axis, and means for lowering said slice receiver step by step, said lowering means including a geared connection with said feeding means and being operative in all positions of adjustment.

2. A slicing machine comprising a rotary knife, a support for said knife, means for moving said support to and fro with said knife in a horizontal cutting plane, a support for the substance to be sliced by said knife, means for feeding said substance down towards said cutting plane, a slice receiver mounted below said support, means for adjusting said support from a horizontal to a vertical position about a horizontal axis, ratchet means operated by the to and fro movement of said support for driving said feeding means, and means for driving said adjusting means by said ratchet means.

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