July 27, 1937. W. J. CAMPBELL 2,087,898

SLICING MACHINE

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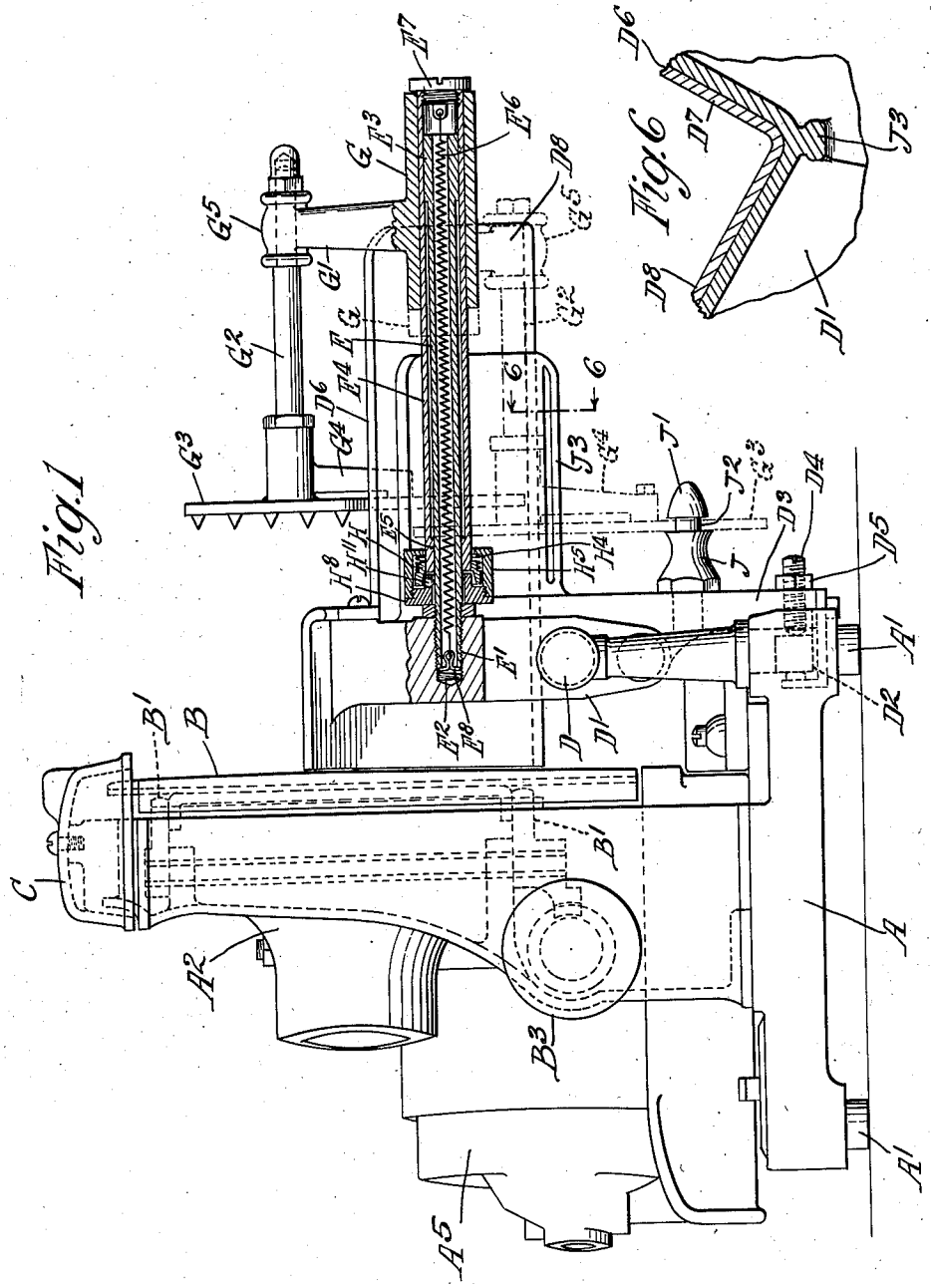


Fig. 1

Fig. 6

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Fig. 2

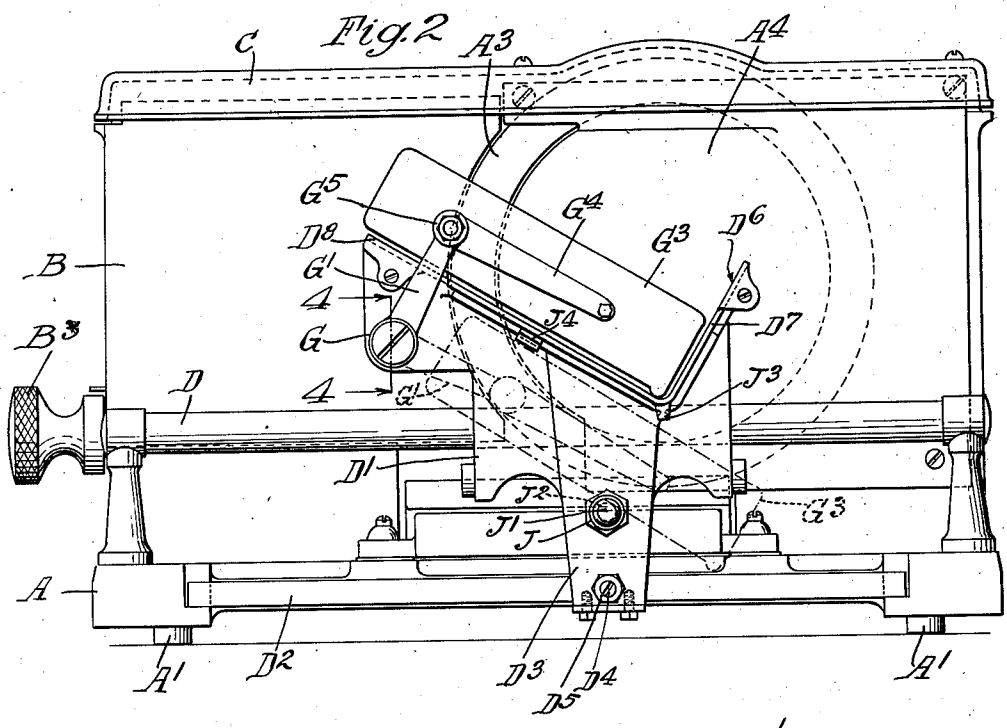


Fig. 4

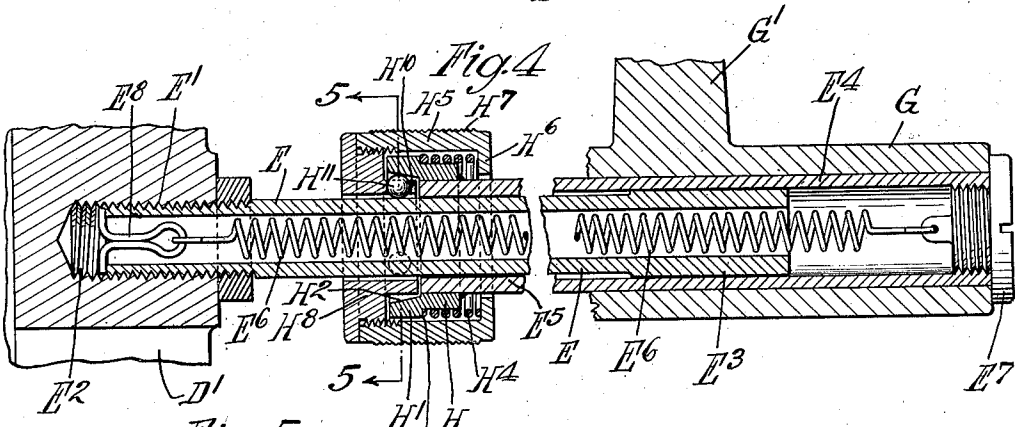
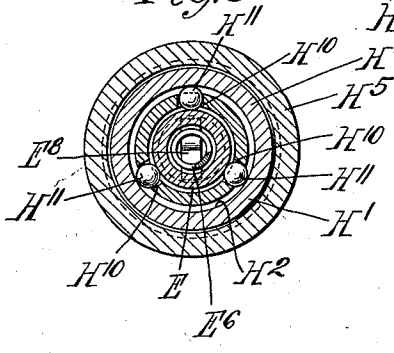


Fig. 5

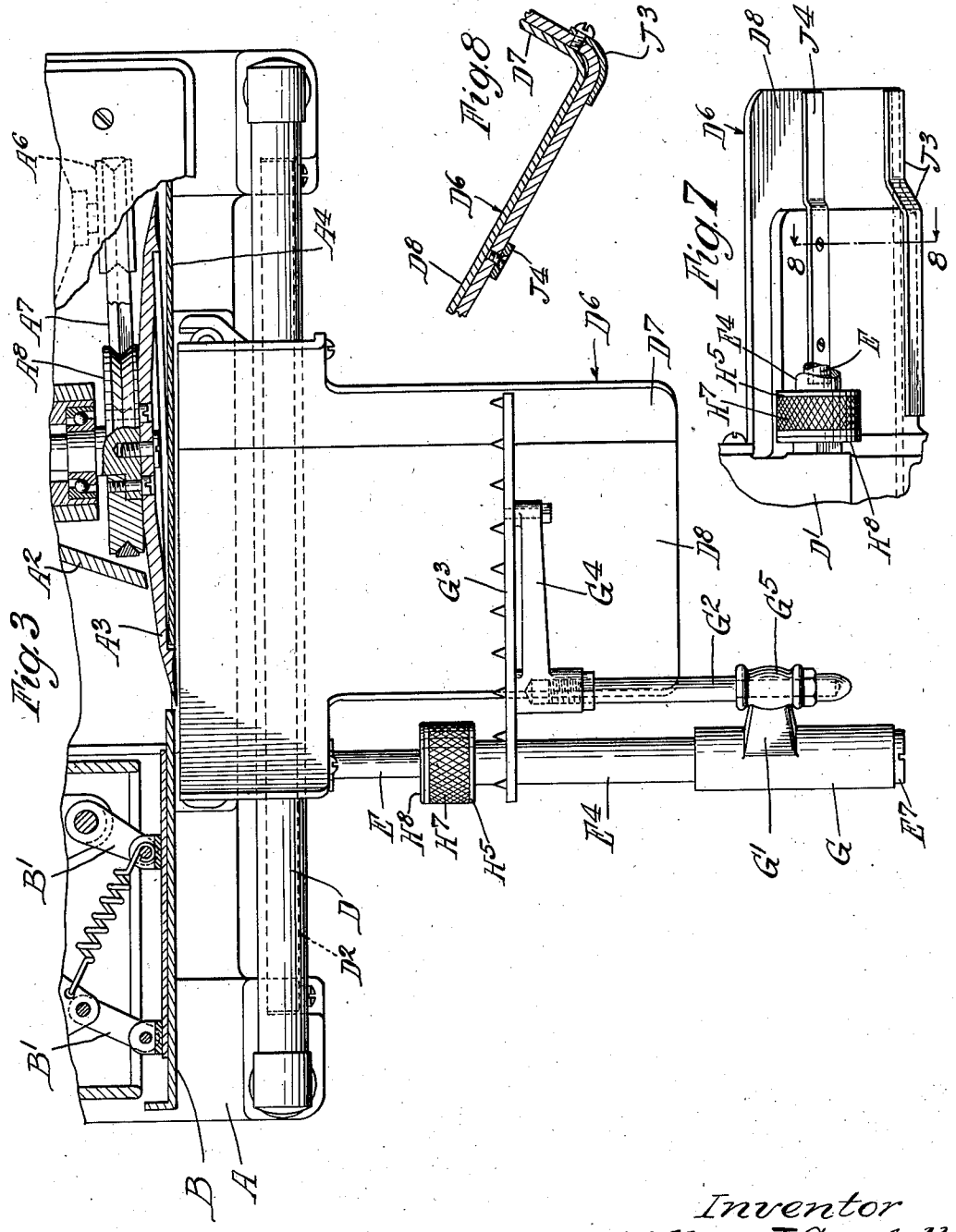


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UNITED STATES PATENT OFFICE

2,087,898

SLICING MACHINE

William J. Campbell, Indianapolis, Ind., assignor to American Slicing Machine Company, Chicago, Ill., a corporation of New York

Application January 7, 1931, Serial No. 507,171

10 Claims. (Cl. 146—102)

My invention relates to a slicing machine of the type in which a knife, for example a rotary knife, is associated with an upright guard plate, a gauge plate generally parallel with the guard plate, and a work supporting carriage for conveying the work past the cutting edge of the knife in general parallelism with carriage and guard plate. One object of my invention is the provision of an improved form of the control or actuating means for a pusher plate on the carriage. Another object is the provision of manual means for permitting or causing the pusher plate to move yieldingly forwardly toward the carriage plate when the carriage is returning, after a cutting excursion, to position for beginning the following cutting excursion. Another object is the provision of means for limiting the forward movement of the pusher plate, together with manually operable means, for interrupting such limiting means. Other objects will appear from time to time in the course of the specification and claims.

I illustrate my invention more or less diagrammatically in the accompanying drawings, wherein—

Figure 1 is an end elevation with parts in section;

Figure 2 is a front elevation;

Figure 3 is a partial plan view;

Figure 4 is a section on the line 4—4 of Figure 2;

Figure 5 is a section on the line 5—5 of Figure 4;

Figure 6 is a section on the line 6—6 of Figure 1;

Figure 7 is a partial end elevation of the carriage illustrating a variant form of guard member; and

Figure 8 is a section on the line 8—8 of Figure 7.

Like parts are indicated by like symbols throughout the specification and drawings.

Referring to the drawings, A generally indicates any suitable slicing machine base, mounted for example on yielding struts A^1. A^2 is an upstanding frame portion upon which may be mounted, in any suitable fashion, the rotary knife A^3 and the forward guard plate therefor A^4. A^5 indicates a motor which may drive the knife A^3 through the pulley A^6, the belt A^7 and the pulley A^8.

B indicates a gauge plate which may be mounted in any suitable fashion, for example on links B^1, responsive to the rotation of the manual control knob B^3, whereby the gauge plate may be moved toward and away from the cutting plane.

C is any suitable cover member.

D is a cylindrical track along which is slidable the carriage structure, generally indicated as D^1. D^2 is a rectangular guide track, herein shown as vertically aligned beneath the track D. It may be engaged, for example by the downward extension D^3 of the carriage structure which serves to prevent unintended rotation of the carriage about the track D. Any suitable take-up means may be employed, such as the screw D^4 and the nut D^5. The form of carriage herein illustrated is shown as including a work supporting and guiding trough D^6, including the walls D^7 and D^8.

Mounted on the carriage structure D^1 and extending outwardly therefrom adjacent the supporting wall or face D^8, is a hollow guide pin or rod E, the inner end of which is screw threaded as at E^1 to be screwed into the screw threaded apertures E^2 in the carriage D^1. Its end is enlarged as at E^3 to serve as a bearing and stop portion for an outer cylindrical sleeve E^4. The sleeve E^4 is inwardly reduced as at E^5, the portions E^3 and E^5 respectively being adapted to stop or limit the outward movement of the sleeve E^4 in relation to the shaft E. A spring E^6 is anchored at one end to the screw threaded plug E^7 which closes the outer end of the sleeve E^4. It is anchored at the other end to an abutment or eye E^8, as shown for example in Figure 4.

Slidably mounted upon the exterior sleeve E^4 is any suitable pusher plate structure, including a sleeve G, a projection G^1 therefrom, a pin G^2 mounted in said projection, and a pusher plate G^3 mounted upon said pin, as by the bracket G^4. The pin G^2 is preferably rotatable in relation to the arm G^1, passing for example through a sleeve G^5.

Interposed between the shaft E and the outer sleeve E^4 is the following locking arrangement. A collar H is secured to the inner end of the sleeve E^4 and includes an inwardly projecting portion H^1, having a beveled or conic locking surface H^2. The member H also includes a seat H^3 for a spring H^4 which surrounds the member H. The opposite end of the spring engages the inward projection H^6 of the generally cylindrical member H^5, shown as exteriorly knurled as at H^7. Its opposite end is closed by the screw threaded plug H^8, which is somewhat spaced from the shaft E and has a cylindrical ring or flange projecting within the conic locking seat

H^2. This flange is broken by a plurality of apertures H^{10}, in which seat balls H^{11}. As will be seen from Figure 4, these balls engage the interior surface of the conic seat H^2. The effect of the spring is to thrust the balls inwardly along the shaft E against the conic locking seat H^2. Thus the normal effect of the spring is to hold the sleeve E^4 against longitudinal movement in relation to the shaft E, and a manual movement of the locking assembly is necessary, in order to free the balls H^{11} from their locking relationship, to permit the spring E^6 to move the pusher plate structure inwardly toward the cutting plane.

It will be understood, as from the full line and dotted line illustration in Figure 2, that the pusher plate may be swung into inoperative position below the carriage, in which position it may be held as by the abutment J, with its forward tapered nose J^1 and its securing circumferential aperture J^2, in which the edge of the pusher plate may sit. In order to prevent the pusher plate from battering the bottom of the carriage structure, I may provide one or more guard members, such as are shown as at J^3, J^4, which prevent the edge of the pusher plate from contacting the bottom of the carriage. These guard members may be integral, as shown in Figure 6, or may be separately formed, as shown in Figures 7 and 8.

It will be realized that whereas I have described and shown a practical and operative device, that nevertheless many changes may be made in size, shape, number and disposition of parts without departing from the spirit of my invention. I wish my drawings, therefore to be taken as in a broad sense illustrative and diagrammatic, rather than as limiting me to my specific showing herein.

The use and operation of my invention are as follows:

The spring E^6 normally tends to move the pusher plate structure G^3 toward the cutting plane, thus moving the work positively against the gauge plate and guard plate. However, it is desirable, when the work is set against the gauge plate, to prevent any additional pressure or continuing spring pressure against the guard plate after the slice is severed. I therefore provide locking means, including the spring H^4, which resists the movement of the spring E^6. The locking means may be released to permit the normal gauging thrust, as by manual movement of the knurled portion of the sleeve H^5, permitting the work to be positioned firmly against the gauge plate. For example a manual forward thrust of the knurled member moves the balls H^{11} out of their locking connection between the opposed surfaces of the members H and E, the spring H^4 being compressed. Then the slicing excursion is made, but the spring E^6 cannot move the work forwardly until the operator again releases the locking means. This he may do at the end of the return excursion, again permitting the spring E^6 to advance the work against the gauge plate. The locking means keeps the material upon the carriage out of contact with the guard plate, knife and gauge plate during the return excursion and thus prevents larding of said members; this also reduces to a minimum sliding or rubbing of the work against a surface which results in cleaner looking slices.

I claim:

1. In a slicing machine which includes a knife and means for actuating it, a gauge plate and a guard plate lying in generally parallel planes, a carriage and means for guiding the carriage across the faces of gauge and guard plates and past the cutting edge of the knife, a pusher plate mounted on said carriage and normally movable toward and away from the cutting plane, spring means for urging the pusher plate toward the cutting plane of the knife, self-locking means tending normally to lock the pusher plate urging means against movement towards the knife while leaving the same free to be retracted, said locking means including a one-way clutch mechanism biased to clutching position, and a manually operable clutch control element for releasing said clutch to permit said spring means to advance the pusher plate.

2. In a slicing machine which includes a knife and means for actuating it, a gauge plate and a guard plate lying in generally parallel planes, a carriage and means for guiding the carriage across the faces of gauge and guard plates and past the cutting edge of the knife, a pusher plate, means for mounting the pusher plate on the carriage for movement toward and away from the cutting plane of the knife including a guide member fixedly mounted on the carriage, a sleeve member slidably mounted upon said fixed guide, said pusher plate being mounted upon said sleeve, yielding means normally tending to move the sleeve and pusher plate toward the cutting plane, self-locking means tending normally to secure the sleeve and guide to lock the sleeve against movement toward the cutting plane while leaving the same free to be retracted, and means manually to release said locking means to allow the yielding means to advance the pusher plate.

3. In a slicing machine which includes a knife and means for actuating it, a gauge plate and a guard plate lying in generally parallel planes, a carriage and means for guiding the carriage across the faces of gauge and guard plates and past the cutting edge of the knife, a pusher plate, means for mounting the pusher plate on the carriage for movement toward and away from the cutting plane of the knife and including a guide fixed on the carriage, a guide for the pusher plate axially movable in relation to said fixed guide, the pusher plate being mounted upon said last mentioned guide, yielding means normally tending to move the movable guide and pusher plate toward the cutting plane, self-locking means including a one-way clutch biased to clutching position interposed between the fixed and the movable guide members and tending to relatively secure said members to lock the movable guide against movement toward the cutting plane of the knife while leaving it free to be retracted, and a manually operable clutch control element for releasing the clutch to permit the yielding means to advance the movable guide and pusher plate.

4. In a slicing machine which includes a knife and means for actuating it, a gauge plate and a guard plate lying in generally parallel planes, a carriage and means for guiding the carriage across the faces of gauge and guard plates and past the cutting edge of the knife, a pusher plate, means for mounting the pusher plate on the carriage for movement toward and away from the cutting plane of the knife and including a guide fixed on the carriage, a guide for the pusher plate axially movable in relation to said fixed guide, the pusher plate being slidably mounted upon said last mentioned guide, yielding means normally tending to move the movable guide and pusher plate toward the cutting plane, a one-way clutch mechanism interposed between the fixed and movable guide members biased to clutching

position and tending normally to secure the guide members together to lock the movable guide against movement towards the knife while leaving the pusher plate free to be retracted, and a manually operable clutch control element to release said clutch to permit the yielding means to advance the pusher plate.

5. In a slicing machine which includes a knife and means for actuating it, a gauge plate, a carriage and means for guiding the carriage across the face of the gauge plate and past the cutting edge of the knife, a pusher plate mounted on said carriage and normally movable toward the cutting plane, guiding means for said pusher plate including a hollow sleeve normally fixed in relation to the carriage, a surrounding sliding sleeve slidable on said first mentioned hollow sleeve, yielding means tending normally to move said last mentioned sleeve, and the pusher plate with it, toward the cutting plane, and self-setting brake means adapted normally to resist such movement of the last mentioned sleeve, said brake means being effective throughout a wide range of positions of the outer sleeve, the pusher plate being slidably and rotatably mounted upon the outer sleeve, and manually operable means for rendering the brake means inoperative, to permit the pusher plate to be advanced toward the cutting plane.

6. In a slicing machine which includes a knife and means for actuating it, a gauge plate, a carriage and means for guiding the carriage across the face of gauge plate and past the cutting edge of the knife, manual means for moving said carriage, a guide on said carriage, generally perpendicular to the cutting plane, a plate mounted for movement along said guide toward and away from the cutting plane, means tending normally to urge the plate along the guide toward the cutting plane and self-acting friction brake means, associated with the plate and guide, tending normally to resist such movement of the plate, said brake means including a member surrounding said guide, a plurality of roller elements interposed between said member and said guide, and yielding means for directing locking pressure against said roller elements, and manual control means, independent of the manual carriage moving means, operable to release said brake means whereby said plate moving means may advance the plate said brake means being effective at a wide range of positions of the plate, and being effective at all times except during the period of manual manipulation of the direct manual control means.

7. In a slicing machine which includes a knife and means for actuating it, a carriage and means for guiding the carriage past the cutting edge of the knife, a pusher plate mounted on said carriage and normally movable toward and away from the cutting plane, spring means for urging the pusher plate toward the cutting plane of the knife, self-locking means tending normally to lock the pusher plate urging means against movement toward the knife while leaving the same free to be retracted, said locking means, independent of movement of the carriage along its path, including a one-way mechanism biased to clutching position, and a manually operable clutch control element for releasing said clutch at any position of the carriage to permit said spring means to advance the pusher plate.

8. In a slicing machine which includes a knife and means for actuating it, a carriage and means for guiding the carriage past the cutting edge of the knife, a pusher plate, means for mounting the pusher plate on the carriage for movement toward and away from the cutting plane of the knife, including a guide member fixably mounted on the carriage, a sleeve member slidably mounted upon said fixed guide, said pusher plate being mounted upon said sleeve, yielding means tending normally to move the sleeve and pusher plate toward the cutting plane, self-locking means tending normally to secure the sleeve and guide to lock the sleeve against movement toward the cutting plane while leaving the same free to be retracted, said locking means being effective at all positions of the carriage along its path, and means manually to release said locking means to allow the yielding means to advance the pusher plate, said last mentioned releasing means being independent of the position of the carriage.

9. In a slicing machine which includes a knife and means for actuating it, a carriage and means for guiding the carriage past the cutting edge of the knife, a pusher plate, means for mounting the pusher plate on the carriage for movement toward and away from the cutting plane of the knife and including a guide fixed on the carriage, a guide for the pusher plate axially movable in relation to the fixed guide, the pusher plate being mounted upon said last mentioned guide, yielding means normally tending to move the movable guide and pusher plate toward the cutting plane, self-locking means including a one-way clutch biased to clutching position interposed between the fixed and the movable guide members and tending to relatively secure said members to lock the movable guide gainst movement toward the cutting plane of the knife while leaving it free to be retracted, said locking means being effective at all positions of the carriage along its path, and a manually operable clutch control element for releasing the clutch to permit the yielding means to advance the movable guide and pusher plate, said last mentioned releasing means being independent of the position of the carriage.

10. In a slicing machine which includes a knife and means for actuating it, a carriage and means for guiding the carriage past the cutting edge of the knife, a pusher plate, means for mounting the pusher plate on the carriage for movement toward and away from the cutting plane of the knife and including a guide fixed on the carriage, a guide for the pusher plate axially movable in relation to said fixed guide, the pusher plate being slidably mounted upon said last mentioned guide, yielding means normally tending to move the movable guide and pusher plate toward the cutting plane, a one-way clutch mechanism interposed between the fixed and movable guide members biased to clutching position and tending normally to secure the guide members together to lock the movable guide against movement toward the knife but leaving the pusher plate free to be retracted, said locking means being effective at all positions of the carriage along its path, and a manually operable clutch control element to release said clutch to permit the yielding means to advance the pusher plate, said last mentioned releasing means being independent of the position of the carriage.

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