Nov. 9, 1943. M. BRUSTOWSKY 2,333,636

SLICING MACHINE

Filed May 16, 1941 3 Sheets-Sheet 1

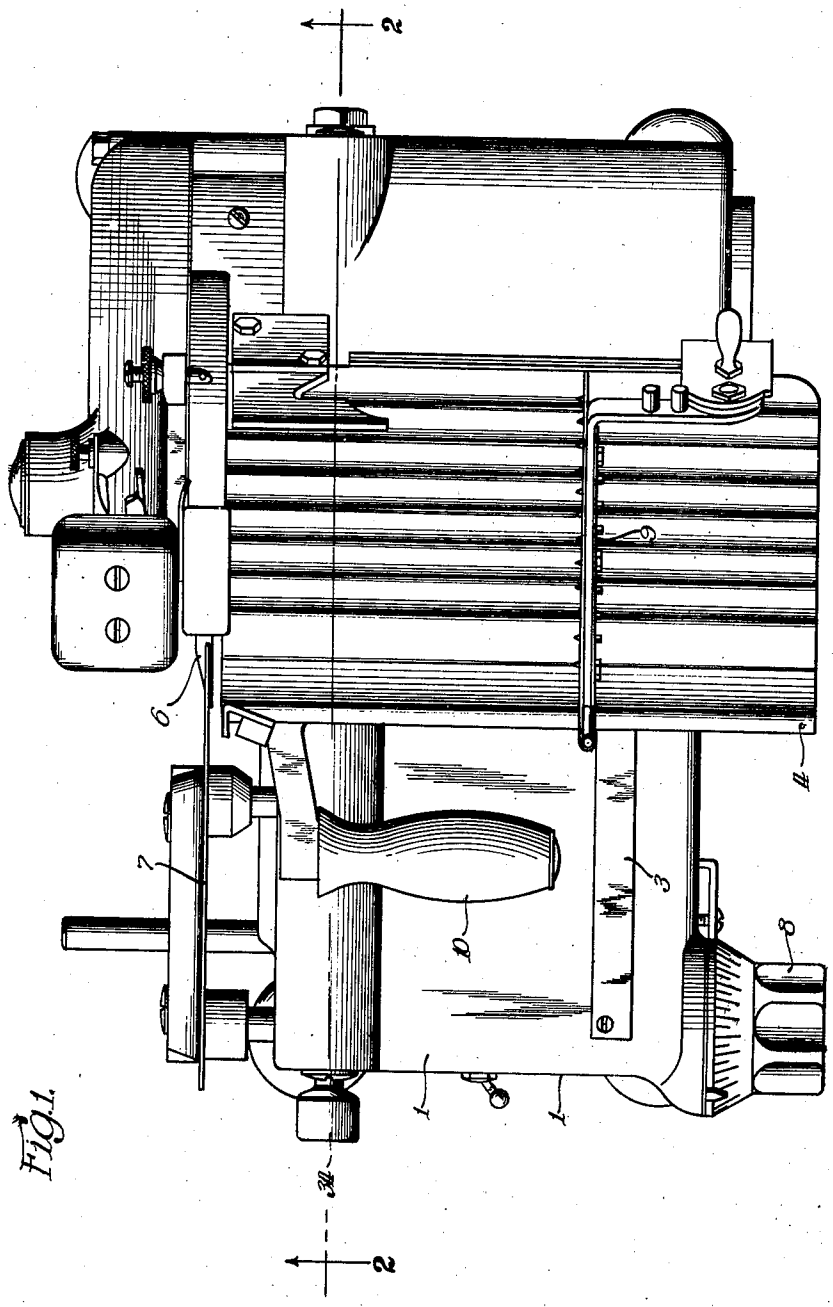


Fig. 1.

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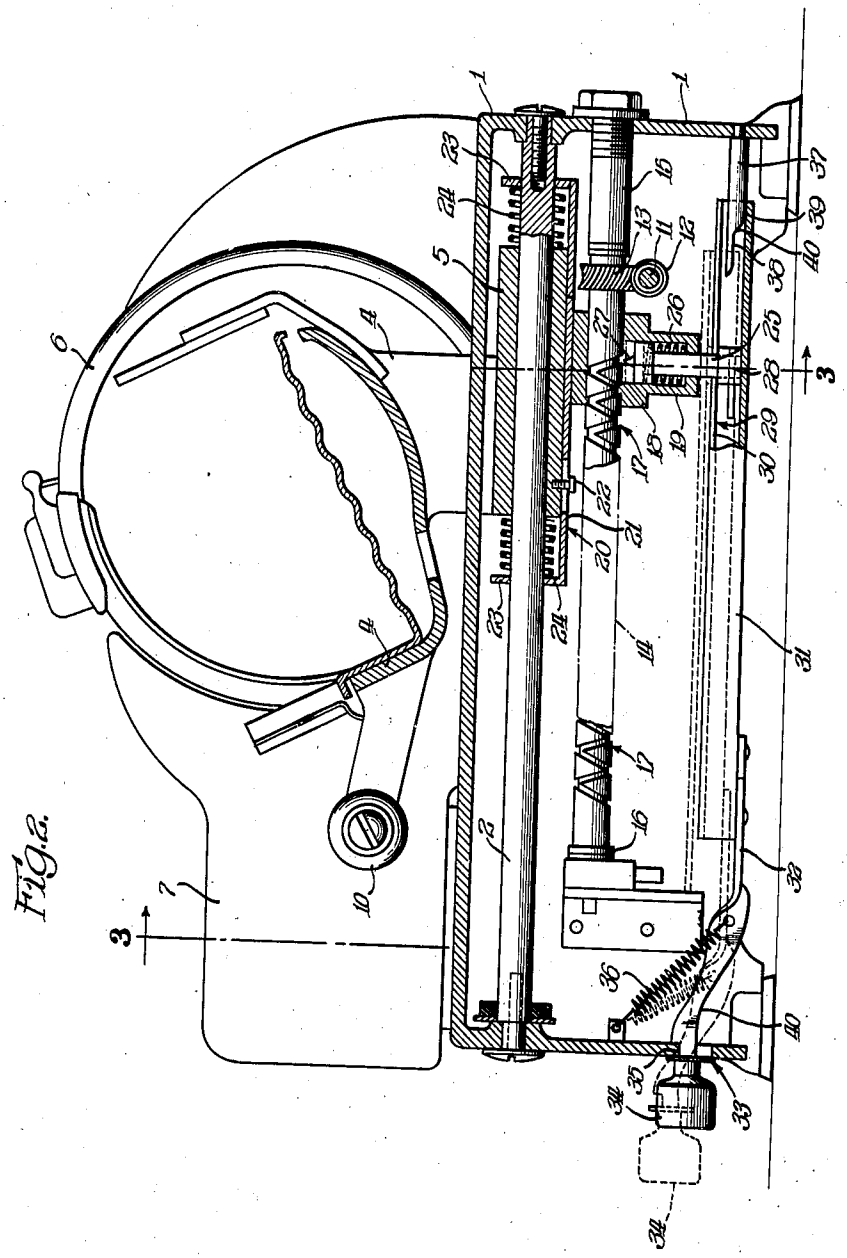


Fig. 2.

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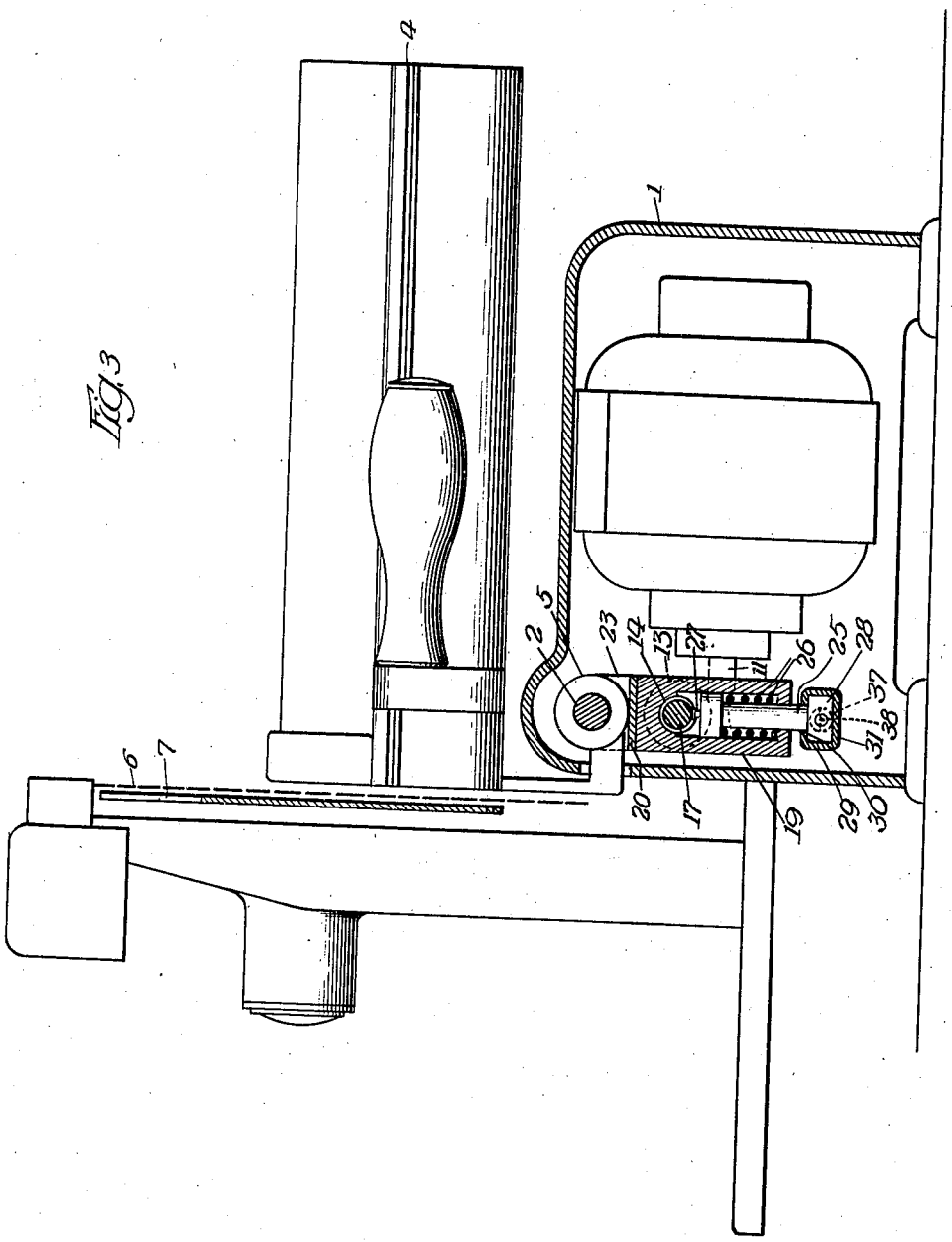
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Fig. 3



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UNITED STATES PATENT OFFICE

2,333,636

SLICING MACHINE

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Application May 16, 1941, Serial No. 393,703

19 Claims. (Cl. 146—102)

This invention relates to slicing machines in general, and particularly to slicing machines of the so-called "push-pull" type having a carriage adapted to be moved manually in a rectilinear direction past the cutting edge of a continuously rotating circular knife.

An important object of the present invention is the provision of novel means for a "push-pull" slicing machine, whereby the carriage may be mechanically connected to the means which drives the knife so that the machine may be operated either manually or mechanically.

Another important object of the invention is to provide a slicing machine with operable means whereby a knife and a reciprocable carriage may be driven mechanically, or the knife driven mechanically and the carriage reciprocated manually.

A further important object of the invention is to provide a slicing machine of the so-called "push-pull" type with new and novel mechanism whereby the operation of an operable member will convert the machine into a full automatic machine permitting automatic operation of the carriage and knife, or manual operation of the carriage and continuous mechanical operation of the knife, as selected.

Still another object of the invention resides in the provision of new and improved means for selective automatic or manual operation whereby the carriage may be either automatically or manually operated in a rectilinear path across the cutting plane of a continuously operating circular knife.

A still further object of the invention is the provision of new and simple means for rendering the slicing machine capable of selective mechanical or manual operation.

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 plan view of a slicing machine, and embodying the invention;

Fig. 2 is a detail longitudinal sectional view on the line 2—2 of Fig. 1; and

Fig. 3 is a transverse vertical section taken on the line 3—3 of Fig. 2.

The particular slicing machine herein shown for the purpose of illustrating the invention comprises a supporting base 1 carrying guide rods or bars 2 and 3 supporting and guiding a substance carriage 4. The carriage 4 is provided with a sleeve 5 which surrounds the guide rod or bar 2 and slides freely thereon. The guide bar 3 is operatively engageable with guide means on the carriage and permits the carriage to be slid freely back and forth in a rectilinear path above the base 1 and past the cutting plane of a circular slicing or cutting knife 6.

A gauge plate 7 is mounted on the knife side of the machine and is operated by a hand index member 8 to move the gauge plate toward or away from the slicing plane so to cause slices of different thickness to be cut by the knife. Substance on the substance platform of the carriage is pressed against the gauge plate 7 by a pusher plate 9, and as the carriage is pushed forwardly (away from the operator) a slice will be cut from the substance. The thickness of the slice will be equal to the distance the gauge plate is away from the cutting plane of the knife 6. The carriage 4 is provided with a handle 10 which is adapted to be grasped by the operator and pushed or pulled to move the carriage in a rectilinear path. The slicing machine so far described is the well-known "push-pull" slicing machine as manufactured by the U. S. Slicing Machine Company of La Porte, Indiana.

The present invention has to do with operating the carriage electrically, there being means provided to connect the carriage to a constantly driven member whereby the carriage may be operated selectively for either automatic or manual operation as desired.

A shaft 11, from the motor (not shown) for driving the circular knife 6, carries a gear 12, Fig. 2 which meshes with a gear 13 on a longitudinal shaft or rod 14. The shaft or rod 14 is mounted in suitable bearings 15 and 16 carried by the base and is constantly driven by the motor shaft 11. The rod 14 is provided with a double groove 17 so as to effect movement of the carriage in each direction when an operable member 18, supported by the carriage, is in mechanical contact, or in operable engagement, in the space or grooves 17 between the lands or ribs of the member 14. The operable member 18 is in the form of a fitting 19, Fig. 2, rigidly secured to a bracket member 20 which is fastened to the sleeve 5 on the carriage. The bracket member 20 comprises a base portion 21 which is provided with one or more slots through which attaching screws 22 pass so as to lock the bracket 20 securely to the sleeve 5 but still permit a predetermined amount of longitudinal movement. End plates 23 are secured to the ends of the bracket member 20 and are provided with cir-

cular openings through which the guide rod 2 passes. Springs 24 are positioned between the end of the members 23 and the ends of the sleeve 5 so as to permit a certain amount of yield or resiliency when the carriage reaches the end of its forward and rearward travel. A certain amount of free longitudinal movement is provided by the slot and pin connection between the bracket 20 with the sleeve 5. The bracket 20, therefore, is secured to the sleeve 5, but provides for a certain amount of flexibility because of the springs 24. This bracket 20 secures the fitting 19 rigidly in position and is adapted to move with the carriage. Conversely, however, the driving movement of the fitting 19 will cause corresponding movement of the carriage 4.

The fitting 19 is hollow, as clearly shown in Fig. 2, and receives a plunger 25 which is urged toward the member 14 by means of a spring 26. The end of the plunger 25 is provided with an operating end or point 27 which is adapted to be moved into engagement with a groove 17. The lower end of the plunger 25 is provided with a supporting head or locking end 28 which is received in a slot 29 between the inturned legs 30 of a channel-shaped operating member 31. This channel-shaped operating member 31 is adapted to be operated to move the plunger into or out of engagement with the grooves 17 in the member 14. An operating bar 32 is secured to the channel-shaped operating member 31, and this bar 32 extends through a slot 33 provided in the front end of the frame. The end of the operating bar 32 is provided with an operating knob 34, and there is a latch 35 on a part of the bar which is adapted to engage the material of the base surrounding the slot 33 so as to hold the member 31 in a predetermined or pre-selected position. A spring member 36 is connected to the bar 32 and to a part of the frame to urge normally the operating member 31 in a direction toward the operator (to the left, Fig. 2). When the latch 35 is out of engagement with a part of the base or frame, the spring 36 will urge the bar 31 to the left, Fig. 2, and move the bar so that the spring 26 will be permitted to raise the driving end 27 of the plunger 25 into engagement with a groove 17. The end of the member 31, opposite to the handle 34, is slidingly received on a pin 37 which is fixed to the end of the frame (to the right, Fig. 2). The forward end of the member or pin 37 is cut away, as shown at 38, so that when the handle 34 is pressed downwardly, and the spring 36 urges the member 31 to the left, Fig. 2, the righthand end of the member 31 passing over the inclined part or cam 40 on the member 37 and being supported on the cut away portion 38 thereof. The member 31 is therefore caused to rise to the position shown in dotted lines in Fig. 2, whereby the operating end or point 27 of the plunger will be in engagement with a groove 17 under action of the spring 26. When the handle member 34 is moved inwardly, as shown in full lines in Fig. 2, the end of the member 31 rides downwardly upon the cam 40 into engagement with the circular part 39 of the member or pin 37 and the member 31 is therefore caused to lower so as to move the operating end or point 27 out of a groove 17. The member 32 also has an upwardly inclined cam surface which operates in the slot 33. This cam surface in cooperation with the cam surface 40 on the member 37 causes the channel-shaped member 31 to be raised or lowered to permit engagement or disengagement of the operating point 27 with a groove 17 when the handle 34 is operated inwardly or outwardly. A spring (not shown) may be carried by the member 37 to assist in proper operation of the member 31 when the member 31 is operated by the knob 34.

During normal operation, the operating knob 34 is pushed inwardly until the latch 35 is in engagement with the metal of the frame surrounding the slot 33. In this position, the channel-shaped member 31 is lowered, as shown in full lines in Fig. 2, at which time the head 28 causes the operating end 27 of the plunger 25 to be retracted out of a groove 17. Therefore, there will be no positive connection between the member 14 and the carriage, and the carriage will be free to be operated back and forth manually in a rectilinear path. However, should it be desired to make the device fully automatically or mechanically operated, the knob 34 is moved downwardly in the slot 33 so as to disengage the latch 35 from the base at which time the spring 36 will pull the channel-shaped member 31 to the left of Fig. 2. Movement to the left of this channel-shaped member 31 causes the member to be raised because of the cam surface on the member 32 and the cam surface 40 on the member 37. The rising or upward movement of the member 31 causes the member to have no pulling effect on the plunger 25 because the inturned flanges or legs 30 will not be engaged with the head 28, and therefore the flanges 30 will have no pulling power to retract the plunger. The spring 26 is then free to press the plunger into operative engagement with the member 14 so that the operating point or end 27 will be in operating engagement with the rod or shaft 14.

The rod or shaft 14 continuously rotates and, therefore, as soon as the plunger is in operative engagement with the spiral groove in the member 14, the carriage will be caused to be moved. One of the grooves 17 drives the carriage in a certain direction until the carriage reaches the end of its travel, at which time the point 27 is caused to come into engagement with the other groove. This latter engagement causes the carriage to be moved in an opposite direction. The double groove 17 causes the carriage to be moved forwardly away from the operator to perform the slicing stroke, and when the carriage reaches the end of its operative travel in that direction, the fitting 15 will be at the far end of the machine at which time the finger 27 will engage the other of said grooves causing the carriage to return to position at the operator's end of the machine. As soon as the carriage reaches the end of its return movement, the operating point or end 27 will become engaged again with the first groove and cause the carriage to perform another slicing stroke. This operation continues and causes continuous back and forth rectilinear movement of the carriage. Therefore, when it is desired to have a full automatically or mechanically operated machine, the knob 34 is operated so as to retract it from its latch; but when it is desired to have a conventional push-pull machine, the operating knob is pushed inwardly, as shown in full lines in Fig. 2, causing disconnection of the plunger from the grooves in the member 14.

The invention provides a machine which is adapted to have its carriage manually moved back and forth past a continuously rotating knife so that the carriage may be operated manually in relatively short strokes so that small pieces of substance, such as sausage and the like,

may be quickly severed without waiting for the carriage to reach the limits of its forward and rearward travel. However, when a relatively large piece of substance, or a considerable amount of substance, is to be sliced, the operator can put the substance in the machine where it will be constantly fed by the feed pusher 6, and be sliced continuously and automatically. The invention provides a relatively simple, rigid, and durable, positively operated device for converting selectively a slicing machine of the push-pull type into a fully mechanical or automatically operating structure. The device is applicable to be applied to existing machines as well as to new machines.

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 its advantages 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. A slicing machine comprising a base, a carriage mounted for reciprocation manually to and fro across the base in a rectilinear path, a knife for cutting slices from substance on the carriage, a motor for operating the knife and selectively operable means for mechanically reciprocating the carriage comprising, a double acting worm driven by the motor, a member attached to the carriage for driving the carriage, means on said member adapted to selectively engage the worm, and means manually operated to effect selective engagement and disengagement of said last named means with the worm.

2. A slicing machine comprising a base, a carriage mounted for reciprocation manually across the base, a knife, motor means for rotating the knife, means driven by the motor, and means for selectively connecting said driven means with the carriage to drive the carriage mechanically, said last named means including a member driven by said driven means, and means providing a resilient driving connection between said member and the carriage, said resilient driving connection providing resilient stops for the carriage at both ends of carriage movement.

3. A slicing machine comprising a base, a carriage mounted on guide rods for manual reciprocation across the base, a knife, a motor for rotating the knife, means including a double acting worm driven by the motor, a fitting adaptable for slidable movement with respect to said means, means providing a resilient driving connection between the fitting and the carriage, means for selectively connecting the fitting to the worm for driving thereby, and manually operated means for controlling the operation of said last named means.

4. A slicing machine comprising a base, a carriage mounted on guide rods for reciprocation manually across the base, a knife, a motor for rotating the knife, means driven by the motor, a longitudinal rod driven by said last named means and mounted on the base, said rod having double grooves therein running in opposite directions, a fitting on the carriage and through which said rod passes, and selectively operated means for causing the fitting to be operatively connected to the grooved rod or disconnected therefrom.

5. A slicing machine comprising a base, a carriage mounted on guide rods for reciprocation manually across the base, a knife, a motor for rotating the knife, means driven by the motor, a longitudinal rod driven by said last named means and mounted on the base, said rod having double grooves therein running in opposite directions, a fitting on the carriage and through which said rod passes, means carried by the fitting and adapted to be selectively moved into engagement with one of said grooves or out of engagement with both of the grooves, and means for operating the last named means.

6. A slicing machine comprising a base, a carriage mounted on guide rods for reciprocation manually across the base, a knife, a motor for rotating the knife, means driven by the motor, a longitudinal rod driven by said last named means and mounted in the base, said rod having double grooves therein running in opposite directions, a fitting through which said rod passes, means providing a resilient driving connection between the fitting and the carriage, and means for selectively causing the fitting to be operatively connected to the grooved rod or disconnected therefrom.

7. A slicing machine comprising a base, a carriage mounted on guide rods for reciprocation manually across the base, a knife, a motor for rotating the knife, means driven by the motor, a longitudinal rod driven by said last named means and mounted in the base, said rod having double grooves therein running in opposite directions, a fitting through which said rod passes, means for connecting the fitting to the carriage, and means for causing the fitting to be operatively connected to the grooved rod including a plunger in the fitting, and shiftable means to operate the plunger to move the plunger into and out of engagement with a groove in said rod.

8. A slicing machine comprising a base, a carriage mounted on guide rods for reciprocation manually across the base, a knife, a motor for rotating the knife, means driven by the motor, a longitudinal rod driven by said last named means and mounted in the base, said rod having double grooves therein running in opposite directions, a fitting through which said rod passes, and means for causing the fitting to be operatively connected to the grooved rod including a plunger in the fitting, and shiftable means to operate the plunger into and out of engagement with the rod.

9. A slicing machine comprising a base, a carriage mounted on guide rods for reciprocation manually across the base, a knife, a motor for rotating the knife, means driven by the motor, a longitudinal rod driven by said last named means and mounted in the base, said rod having double grooves therein running in opposite directions, a fitting through which said rod passes, and means for causing the fitting to be operatively connected to the grooved rod including a plunger in the fitting, means supporting the plunger for movement into and out of engagement with the rod, and means for shifting the plunger, said last named means comprising a channel-shaped member engaging a knob on the end of the plunger.

10. A slicing machine comprising a base, a carriage mounted on guide rods for reciprocation manually across the base, a knife, a motor for rotating the knife, means driven by the motor, a longitudinal rod driven by said last named means and mounted in the base, said rod having double grooves therein running in opposite directions, a fitting through which said rod passes, and means for causing the fitting to be opera-

tively connected to the grooved rod including a plunger in the fitting, means supporting the plunger for movement into and out of engagement with the rod, means for shifting the plunger, said last named means comprising a channel-shaped member engaging a knob on the end of the plunger, a pin carried by the base and engaging the channel-shaped member, and a cam on the pin.

11. A slicing machine comprising a base, a carriage mounted on guide rods for reciprocation manually across the base, a knife, a motor for rotating the knife, a double acting worm extending longitudinally of said base, means for rotating said worm by said motor, a fitting carried by said carriage and adapted for slidable movement with said worm, a plunger in said fitting, spring means normally urging said plunger into engagement with said worm, and means operable against said spring means for moving the plunger out of engagement with respect to said worm, said last named means including an operating member extending along the entire length of said worm.

12. A slicing machine comprising a base, a carriage mounted for reciprocation across said base, a knife, a motor for rotating the knife, a member carried by said carriage, means driven by said motor, means for selectively connecting and disconnecting said member with said last named means to effect driving of said carriage by said motor, and means providing a resilient driving connection between said member and said carriage comprising a longitudinally extending plate, a pin and slot connection between said plate and a portion of the carriage, and spring means between the ends of said plate and a portion of the carriage.

13. A slicing machine comprising a base, a carriage mounted on guide rods for reciprocation manually to and fro across the base, a knife, a motor for rotating the knife, a longitudinal rod driven by the motor, said rod having double grooves therein running in opposite directions, a fitting adaptable for slidable movement with respect to said rod, means connecting the fitting to the carriage, and manually operated means for selectively providing a driving connection between the fitting and the grooves of said rod to cause the carriage to be operated mechanically.

14. A slicing machine comprising a base, a carriage mounted for reciprocation manually across the base, a knife, motor means for rotating the knife, means driven by the motor, and means for selectively connecting said driven means with the carriage to drive the carriage mechanically, said connecting means including a member driven by said driven means, and double acting spring means for providing a resilient driving connection between said member and the carriage.

15. A slicing machine comprising a base, a carriage mounted for reciprocation manually across the base, a knife, motor means for rotating the knife, means driven by the motor, and means for selectively connecting said driven means with the carriage to drive the carriage mechanically, said last named means including a member driven by said driven means and a pair of springs interposed between spaced portions of said member and a portion of the carriage.

16. A slicing machine comprising a base, a carriage mounted on guide rods for reciprocation manually across the base, a knife, a motor for rotating the knife, a double acting worm extending longitudinally of said base, means for rotating said worm by said motor, a fitting carried by said carriage and adapted for slidable movement with respect to said worm, a plunger in said fitting, and means for selectively moving said plunger into and out of engagement with said worm, said last named means including an operating member extending along the entire length of said worm.

17. A slicing machine comprising a base, a carriage mounted on guide rods for reciprocation manually across the base, a knife, a motor for rotating the knife, a double acting worm extending longitudinally of said base, means for rotating said worm by said motor, a fitting carried by said carriage and adapted for slidable movement with respect to said worm, a plunger in said fitting, and means for selectively moving said plunger into and out of engagement with said worm, said last named means including an operating member extending along the entire length of said worm, and means for moving said operating member longitudinally with respect to said worm.

18. A slicing machine comprising a base, a carriage mounted for reciprocation manually to and fro across the base in a rectilinear path, a knife for cutting slices from substance on the carriage, a motor for operating the knife, and selectively operable means for mechanically reciprocating the carriage comprising a double-acting, self-reversing worm driven by the motor and manually controlled means operable selectively to connect and disconnect the worm and carriage in operative relation.

19. A slicing machine comprising a base, a carriage mounted for reciprocation manually to and fro across the base in a rectilinear path, a knife for cutting slices from substance on the carriage, a motor for operating the knife, and selectively operable means for mechanically reciprocating the carriage, a worm driven by the motor and having a self-reversing groove, and means operable selectively to connect and disconnect the worm and carriage in operable relation.

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