A. R. LUSCHKA AND J. FOLK.
STACKER FOR SLICING MACHINES.
APPLICATION FILED SEPT. 8, 1919.

1,376,775.

Patented May 3, 1921.

7 SHEETS—SHEET 1.

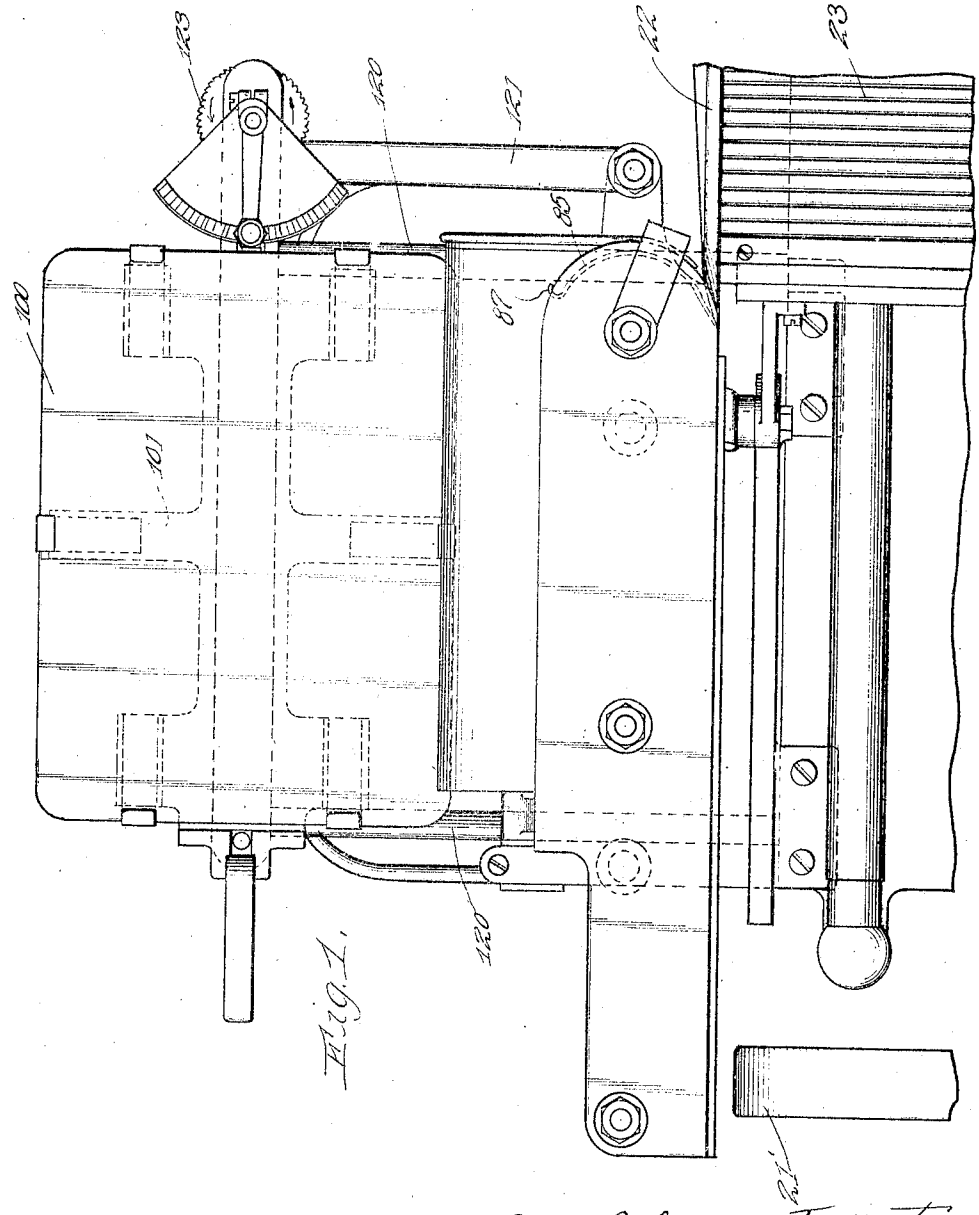


Fig. 1.

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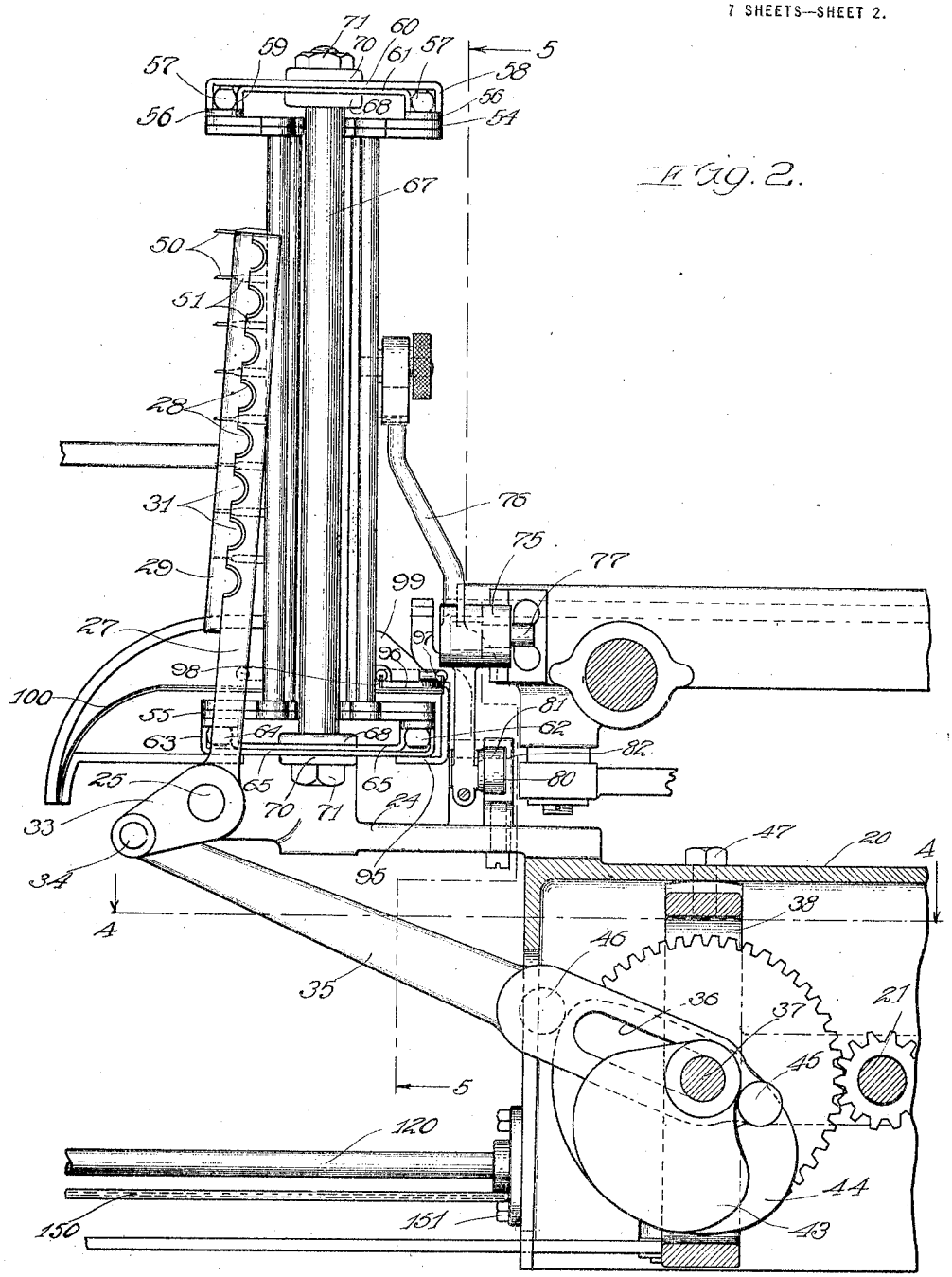


Fig. 2.

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Fig. 3.

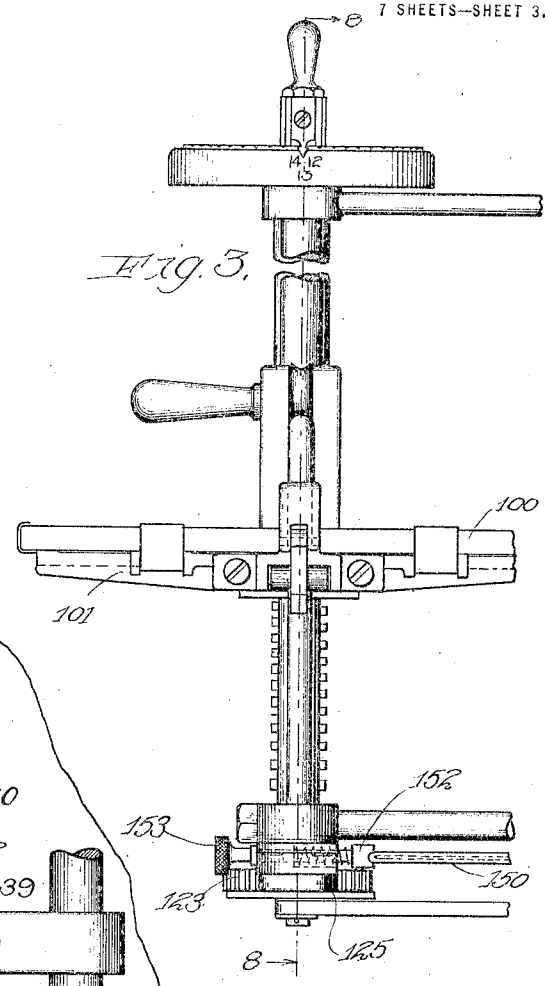


Fig. 4.

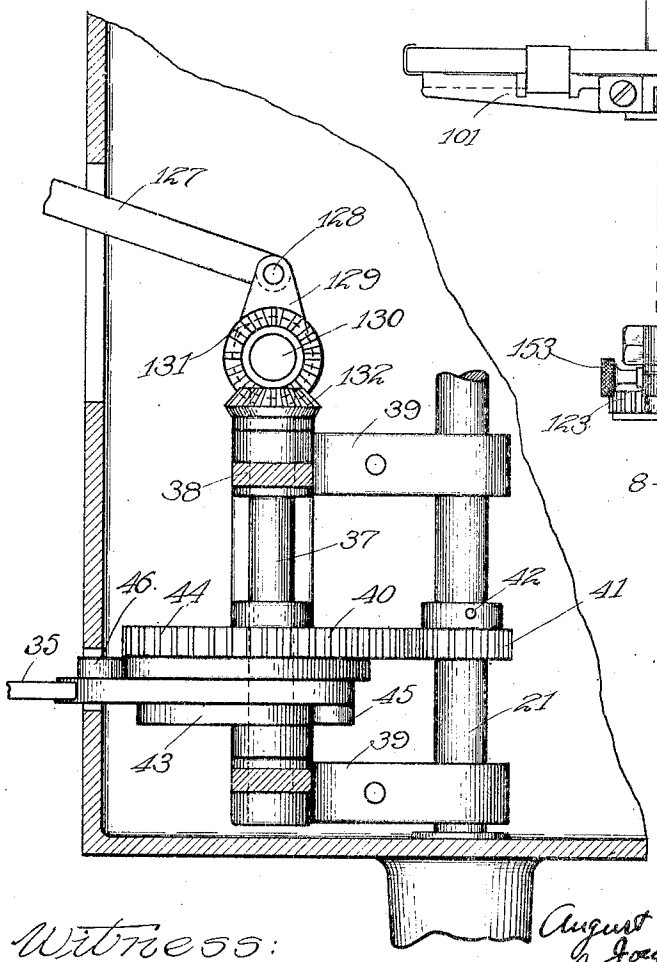
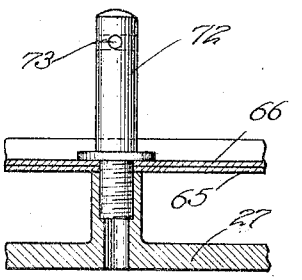


Fig. 11.



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7 SHEETS—SHEET 4.

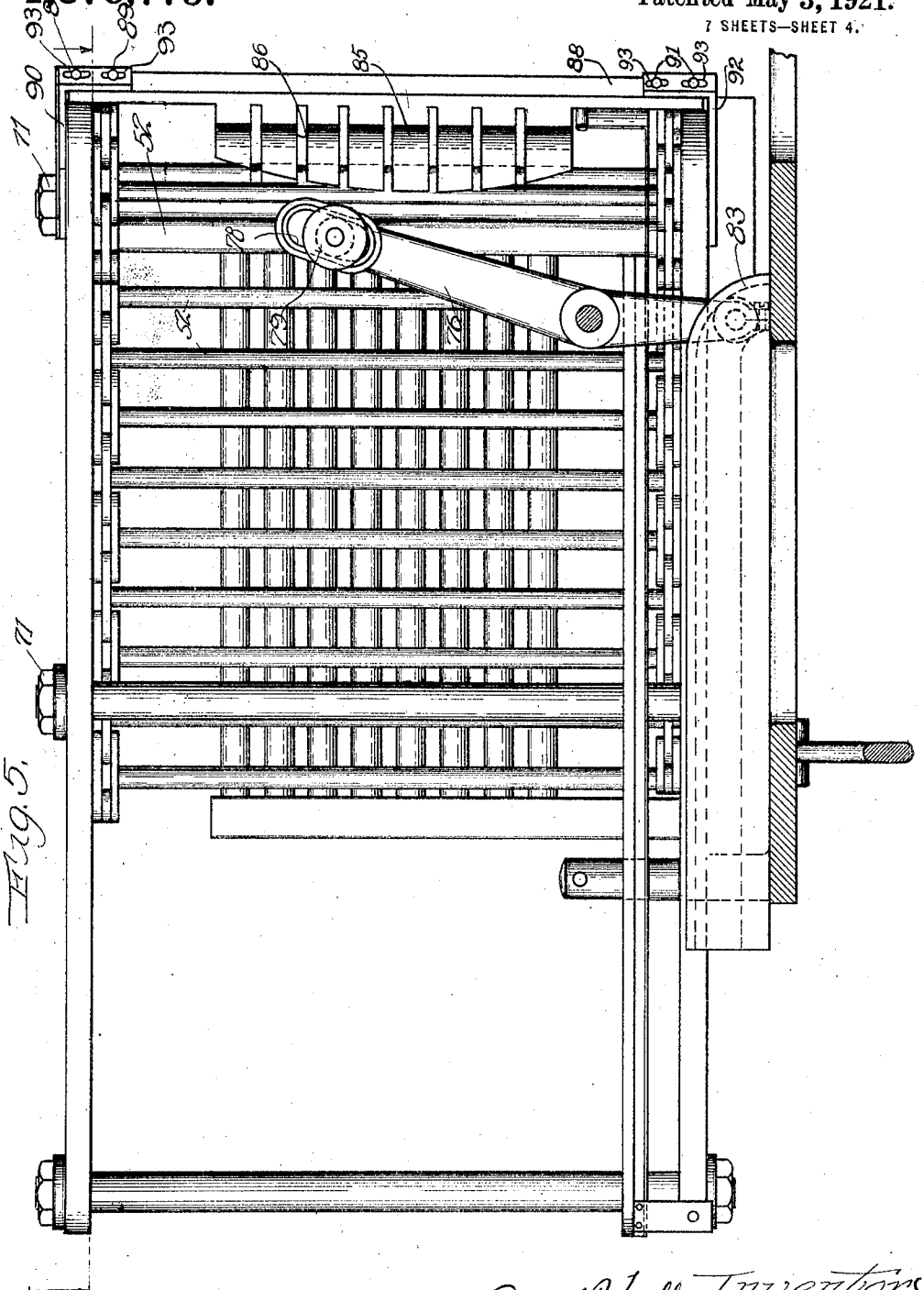


Fig. 5.

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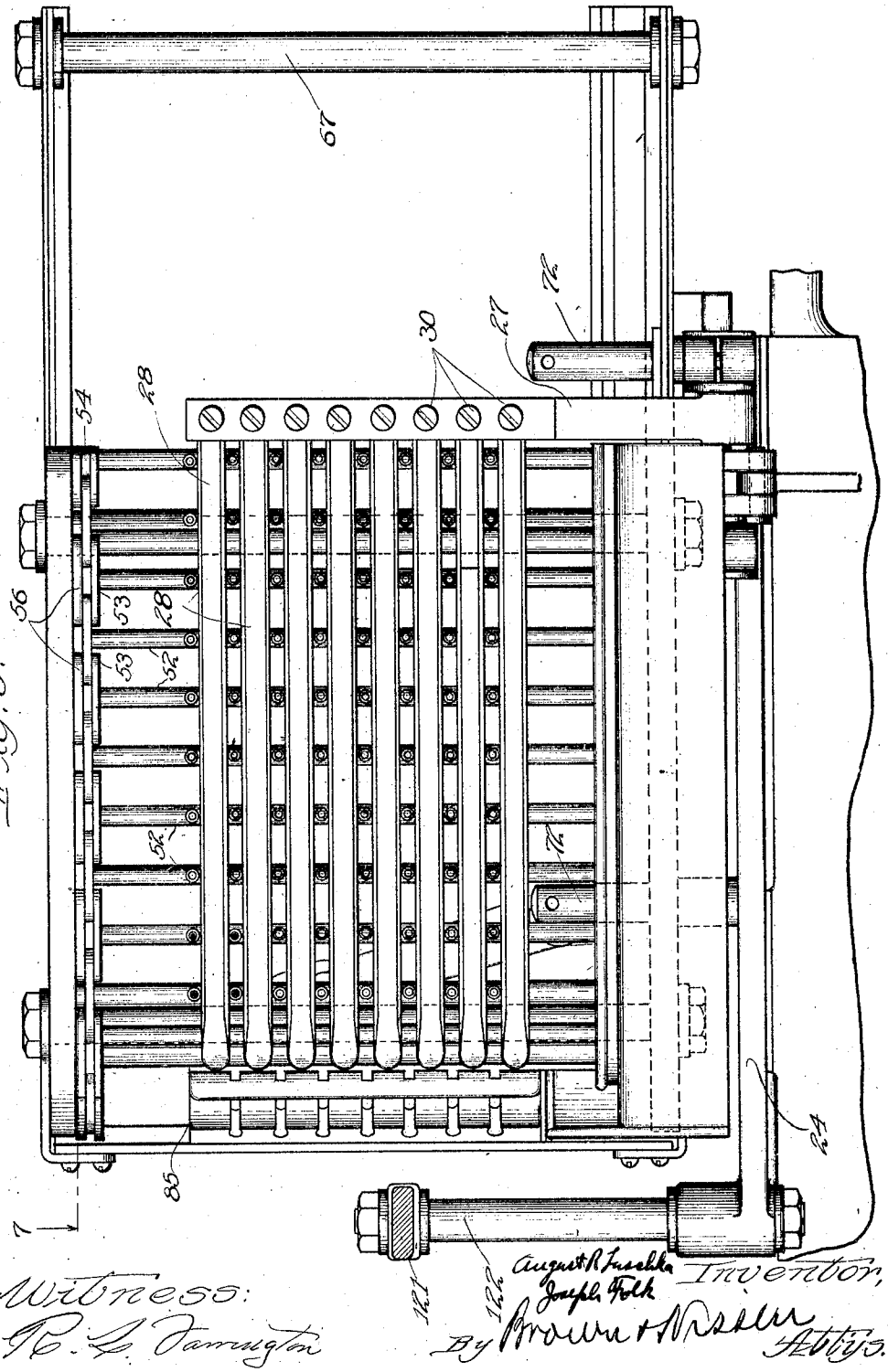


Fig. 6.

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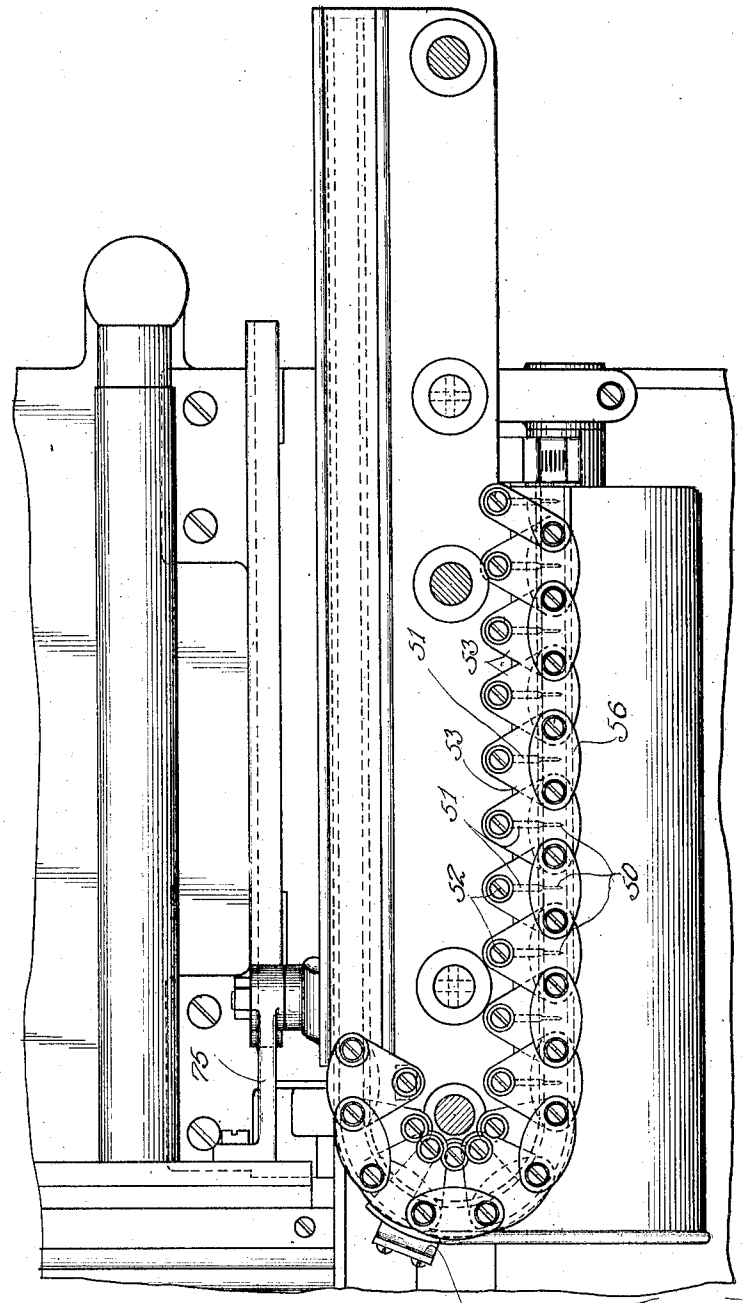
Patented May 3, 1921

7 SHEETS—SHEET 6.

Fig. 12.



Fig. 7.



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STACKER FOR SLICING MACHINES.

APPLICATION FILED SEPT. 8, 1919.

1,376,775.

Patented May 3, 1921.

7 SHEETS—SHEET 7.

Fig. 10.

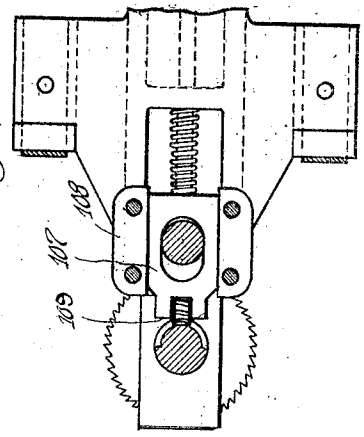


Fig. 9.

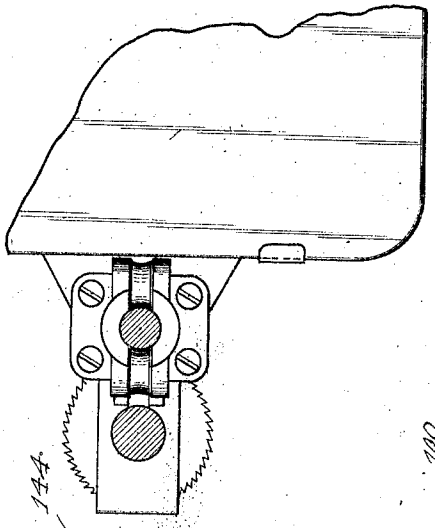


Fig. 8.

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UNITED STATES PATENT OFFICE.

AUGUST R. LUSCHKA AND JOSEPH FOLK, OF LAPORTE, INDIANA, ASSIGNORS TO U. S. SLICING MACHINE COMPANY, OF LAPORTE, INDIANA, A CORPORATION OF INDIANA.

STACKER FOR SLICING-MACHINES.

1,376,775. Specification of Letters Patent. Patented May 3, 1921.

Application filed September 8, 1919. Serial No. 322,358.

To all whom it may concern:

Be it known that we, AUGUST R. LUSCHKA and JOSEPH FOLK, citizens of the United States, residing at Laporte, in the county of Laporte and State of Indiana, have invented certain new and useful Improvements in Stackers for Slicing-Machines, of which the following is a specification.

This invention has for its object the provision of mechanism which shall receive slices from a slicing machine and deposit them in stack formation and which shall be of improved construction and operation. The invention is exemplified in the combination and arrangement of parts shown in the accompanying drawings and described in the following specification, and it is more particularly pointed out in the appended claims.

In the drawings—

Figure 1 is a fragmentary top plan view of a stacker for a slicing machine showing a portion of the machine with which the stacker is connected;

Fig. 2 is a fragmentary elevation looking from the left in Fig. 1, with parts in section;

Fig. 3 is a view similar to Fig. 2 of a portion of the stacker not shown in Fig. 2;

Fig. 4 is a horizontal section substantially on line 4—4 of Fig. 2;

Fig. 5 is a vertical sectional view on line 5—5 of Fig. 2;

Fig. 6 is a front elevation of the stacker, with parts in section;

Fig. 7 is a horizontal sectional view on line 7—7 of Fig. 6;

Fig. 8 is a vertical sectional view on line 8—8 of Fig. 3;

Fig. 9 is a horizontal section on line 9—9 of Fig. 8;

Fig. 10 is a horizontal section on line 10—10 of Fig. 8;

Fig. 11 is a fragmentary vertical section showing detail of construction; and

Fig. 12 is a detail of the end of one of the figures of the stacker fly.

The present invention relates to that form of stacker shown in the co-pending application of Joseph Folk, Serial No. 230,695, filed April 25, 1918, and comprises improvements over the structure shown in that application.

The numeral 20 designates generally the frame of a slicing machine of well known construction having a main drive shaft 21 which may be rotated by a hand wheel 21′ or may be operated by a power motor, or in any other suitable manner, and which operates a slicing knife 22 and a reciprocating table 23 by mechanism well known in the art. A supporting plate 24 is secured to the upper face of the frame 20 and forms a base which carries the greater part of the stacker mechanism comprised in this invention. At the forward edge of the plate 24, as shown in Figs. 2 and 6, there is journaled a shaft 25 to which is rigidly secured an arm 27 forming the operating mechanism for a stacker fly. The arm 27 carries a plurality of stacker fingers 28 which are semicircular in section as indicated in Figs. 2 and 12, and which are held in place on the arm 27 by a bar 29 fastened to the front face of the arm by a plurality of screws 30. The bar 29 is provided with inwardly extending arcuate projections 31 which fit into the grooves in the fingers 28 and assist in holding the fingers firmly in place in grooves cut in the face of the arm 27. The ends of the fingers 28, as shown at 32 in Fig. 12, are flattened and curved inwardly for a purpose to be pointed out.

The shaft 25 is provided at one end with a rocker arm 33 to the end of which is pivoted at 34 a link 35 by means of which the shaft 25 and the fly 27 are reciprocated. The end of the link 35 opposite the pivot 34 is slotted, as shown at 36, the slot passing over a shaft 37 journaled in a frame 38, as shown in Figs. 2 and 4. The frame 38 is rectangular in form and provided with laterally extending arms 39 having bearings at their ends for receiving the main drive shaft 21. A spur-gear 40 is secured to the shaft 37 and is arranged to mesh with a pinion 41 fastened to the shaft 21 by a pin 42. A pair of cams 43 and 44 are secured to the shaft 37 and bear against rollers 45 and 46 respectively, which are carried on opposite faces of the link 35. It will be apparent that this arrangement positively moves the link 35 so that it reciprocates back and forth on the shaft 37, being guided in its movements by the slot 36 and the pivotal connection with the rocker arm 33. The movement of the link 35 to the left, as viewed in Fig. 2, is effected by the roller 46 and the movement of the link in the opposite direction is ef-

fected by the roller 45. The frame 38 with its projections 39 constitutes a self contained unit for holding the shaft 37, the gear 40 and the cams 43 and 44 so that the gear 40 is maintained in operative engagement with the pinion 41 by the connection of the arms 39 with the main drive shaft 21. The frame 38 is held in place on the main frame 20 of the slicing machine by a single machine screw 47 passing through a hole in the top of the frame 20 and threaded into the upper portion of the frame 38.

As the slices are formed by the knife 22 they are received on the pointed ends 50 of pins 51 which are carried by upright bars 52. The bars 52 have their opposite ends connected with links 53 of upper and lower conveyer chains 54 and 55, respectively. As will be seen from Figs. 5, 6 and 7 the links 53 of the conveyer chains are triangular in outline and are pivotally connected to one another adjacent two of the apexes of the triangles formed by the links. By this arrangement the links overlap one another and the third apex of each triangle projects inwardly and carries one of the bars 52 on which the slice-engaging pins 51 are mounted. The pointed ends 50 of the pins 51 project into the vertical plane of the pivotal connections between the links 53. Rows of wear plates 56 bridge the spaces between the alternate pairs of links 53 so that each chain 54 and 55 is made up of single links 53 which alternate with double links comprising a triangular link 53 and a wear plate 56. This arrangement shows very clearly in Fig. 6.

The pivots which connect the links of the chain 54 project upwardly beyond the wear plates 56, as shown in Fig. 2, and the projecting portion of each pivot is provided with a roller 57 which travels in a groove formed by angular flanges 58 and 59 carried at the edges of plates 60 and 61, respectively. In a similar manner the pivots for the chain 55 project downwardly and are provided with rollers 62 traveling in grooves formed by angular flanges 63 and 64 on the edges of plates 65 and 66, respectively. The plates 60, 61, 65 and 66 are preferably of sheet metal having their flanges stamped or pressed into shape so that when the sheets are properly held together they form the upper and lower portions of the conveyer frame for the stacker and their bent over flanges constitute guides for the conveyer chains. The sheet metal plates are held together, and held in proper relation to one another, by circular bars or posts 67 provided with flanges 68 which bear against the inner faces of the plates 61 and 66 respectively, the ends of the bars 67 passing through openings in the sheet metal plates and being provided with washers 70 and nuts 71 for clamping the sheet metal plates together and for holding them in rigid relation to one another and to the bars 67. The conveyer frame made up of the plates 60, 61, 65 and 66 and the upright bars 67, together with the parts carried by the frame, is bodily detachable from its mounting on the supporting plate 24 and is held in place on this plate by a pair of centering pins 72. The pins 72 are passed through openings in the lower plates 65 and 66 and are threaded into sockets in the supporting plate 24, as shown in detail in Fig. 11. The pins 72 may be provided with openings 73 through which a bar may be passed for turning the pins to loosen them or tighten them in their sockets.

As shown in Figs. 2 and 7, the reciprocating table 23 is provided with a bracket 75 which extends outwardly from the edge of the table and to which an arm 76 is pivoted by a bolt 77. The upper end of the arm 76 is slotted, as shown at 78 of Fig. 5, and receives a pivot pin 79 carried on the end of one of the upright conveyer bars 52. The lower end of the arm 76 is provided with a cap roller 80 which travels in a groove 81 formed by the flanges of a channel guide 82. The channel guide 82 is provided with a downwardly curved portion 83 at the end adjacent the slicing knife 22. As the table 23 reciprocates the arm 76 will move in unison with the table during the portion of the movement in which the roller 80 travels in the straight portion of the channel guide 82. This will cause the bars 52 of the conveyer chain to travel in unison with the reciprocating table 23 so that the pointed ends of the pins 51 will travel with the material being sliced. The stacker frame is so positioned relative to the cutting plane of the slicing knife that the pointed ends 50 will slightly enter the face of the material being cut when the material is moved into the plane of the slicing knife prior to the advance movement of the cutting table. The downwardly curved portion 83 of the channel guide 82 is so positioned relative to the knife and table that the roller 80 will reach the curved portion of the guide after the slice has been completely severed from the material. When this position of the parts has been reached further movement of the slicing table will cause the upper end of the arm 76 to travel much more rapidly than the slicing table, for the reason that the lower end of the arm is practically held stationary. The rapid movement of the upper end of the arm 76 is for the purpose of advancing the conveyer chain around the curve formed by the guide plates 60, 61, 65 and 66 adjacent the slicing knife, as shown in Fig. 7. This movement will carry the slice away from the slicing knife and into the plane parallel with the slicing plane but spaced away from the slicing knife, as shown by the position of the portion of the chain in Fig. 7, pro-

vided with pins 51. As the links of the chain pass around the curve in the chain guide the upright bars 52 are brought close together, as shown in Fig. 7, and the triangularly shaped links overlap one another to permit bending of the chain about the curve formed by its guides. During this movement the pointed ends 50 of the pins 51 remain in alinement with the link pivots, so that the spacing of the points relative to one another is not affected by the bending of the chain. At the same time there is no danger that overlapping edges of the links will catch or bind upon one another for the reason that the links are partially overlapped at all times and their surfaces simply slide relative to one another when the chain is bent.

As the slice is carried by the pins 51 about the curve adjacent the slicing guide it is moved by a guard plate 85 into closer engagement with the pins by which it is carried. The guard plate 85, as shown in Fig. 5, is provided with a series of slots 86 through which the points of the pins 51 project as they swing about the curve at the end of the conveyer frame and the plate 85 is slightly eccentric relative to the curve of the chain guides so that the points of the pins enter more deeply into the slots as the pins pass around the curve, so that the slice of material carried by the pins is forced farther onto the points during the movement of the slice in contact with the guard plate. As shown in Fig. 5, the edge of the guard plate 85 adjacent to the slicing knife is shaped to conform to the contour of the edge of the knife so that the slice is moved away from the edge of the knife almost immediately after it is severed from the material being sliced at all points about the cutting edge of the knife. The opposite edge of the guard plate 85, as shown in Fig. 1, is provided with a rounded or backwardly turned portion 87 which strengthens the plate against bending. The plate 85 is supported by an upright bar 88 to which the plate is secured and which is fastened at its upper end by screws 89 to an angle bar 90 and at its lower end by screws 91 to a similar angle bar 92. The angle bars 90 and 92 are provided with elongated slots 93 through which their respective screws pass so that the supporting bar 88 for the guard plate 85 may be adjusted vertically to properly aline the slots 86 with the pins of the conveyer. The angle bar 90 is provided with an opening through which the upper end of one of the rods 67 passes and the bar is secured in place by the nut 71 on the end of the rod 67. The bar 92 is similarly held in place by the nuts 71 on the lower end of the rod 67. It will be apparent that the guard plate 85 may be adjusted angularly about the axis of the rod 67 by loosening the nuts 71 and swinging the angle bars 90 and 92 to bring the guard plate 85 into its proper position. This adjustment is desirable for the purpose of bringing the inner edge of the guard plate into proper position relative to the face of the slicing knife. The slots 86 of the guard plate may be tilted slightly so as to bring them in proper horizontal alinement by holding one of the angle bars 90 and 92 in fixed position and rotating the other of the angle bars about the axis of the rod 67, or even a greater tilting of the slots may be secured by rotating one of the angle bars 90 and 92 in one direction and the other angle bar in the opposite direction about the axis of the rod 67.

A bracket plate 95 is secured to the lower face of the guide plate 65 and projects upwardly into a position above the level of the conveyer chain 55, as shown in Fig. 2. The bracket plate 95 carries at its upper edge a trough-shaped channel plate 96 which is curved to conform to the curvature of the guides for the slice conveyer and is provided with side flanges 97 and 98 to prevent material from falling from the channel. The channel 96 is for the purpose of intercepting small particles of material that may fall from the slicing knife or from the pins of the conveyer chain and for preventing their contact with operating parts of the machine. A scraper 99 is carried by one of the bars 52 and travels in the curve formed by the channel 96 so that any material accumulating in the channel is carried by the scraper around the curve at the end of the conveyer into a position at the side of the conveyer opposite the reciprocating table. On this side of the conveyer the outer flange 97 of the channel 96 is omitted so that the scraps of material thus deposited are free to move over a curved plate 100 onto a scraper tray to be described. Scraps of material in the channel 96 will thus be removed during the slicing movement of the reciprocating table, the scraper 99 being arranged to follow behind the slice so that no material will be deposited in the channel after the passage of the scraper. The channel will thus be cleared after each slicing operation.

The fingers 28 of the slice discharge fly are arranged to lie in the position indicated in Fig. 2 during the movement of the conveyer which brings the slice into position adjacent the discharge fly. It will be seen from Fig. 2 that these fingers enter between the rows of pins 51 back of the slice carried on the pointed ends 50 of these pins and the parts are so related that the fly will be moved by the cam 44 in a clockwise direction, as viewed in Fig. 2, so as to strip the slice from the points of the fingers 51 during the pause of the conveyer at the end of its travel and while the slice is thus held stationary by the pins of the conveyer. The

fingers 28, as previously stated and as shown in Fig. 12, are curved at 32 so that they enter readily behind the slice as it is carried by the conveyer into discharge position and the semicircular shape of the fingers reduces the friction between the slice and the fly in case the slice engages the fingers, for the reason that only narrow edges are presented to the face of the slice.

The curved shape of the fingers also adds materially to their stiffness and at the same time the shape is one which is easy to manufacture, since the fingers may be formed from standard tubing or may be easily pressed from sheet metal.

As the slice is discharged from the conveyer by the reciprocation of the fly 27 it is turned through an angle of 90 degrees so that it is brought from a vertical, into a horizontal plane, and it is permitted to drop from the face of the fly onto a receiving tray 100, shown in Figs. 1, 3 and 8. The tray 100 is supported on a frame or spider 101, shown in broken lines in Fig. 1, the frame 101 being mounted to move vertically on upright rods 102 and 103. An elongated sleeve 104 rigidly connected with the frame 101 travels on the rod 102 and is provided with rollers 105 which bear against the periphery of the rod 102. The sleeve 104 and rollers 105 support the frame 101 in horizontal alinement so that the frame has no supporting connection with the rod 103 at the end opposite the sleeve 104. The rod 103, however, passes through an opening 106 in the frame 101 so that the frame and tray 100 are prevented from swinging laterally about the rod 102 as an axis by means of the upright 103. A slide block 107 is mounted in guides 108 beneath the sleeve 104 and is provided at its outer end with a tooth piece or half nut 109. The rod 110 is threaded at 111 into engagement with the slide block 107 and passes through a guide 112 on the lower face of the frame 101 and is provided with a yoke 113 at the end opposite of the slide block 107 by means of which the rod is pivotally connected with a lever 114. The lever 114 is pivoted at 115 to a handle 116 carried by the frame 101. A coil spring 117 normally presses the slide block 107 to the left, as viewed in Fig. 8, to bring the half nut 109 into engagement with an upright screw 118. By grasping the handle 116 and the lever 114 the frame 101 and the tray 100 may be moved up or down along the rod 102 and may be stopped in any desired vertical position by releasing the lever 114 and permitting the half nut 109 to engage the threads of the screw 118. When the half nut is in engagement with the screw it will be fed vertically by rotation of the screw effected by mechanism to be described.

The uprights 102 and 103 and the screw 118 are carried by a bar 119 supported by rods 120 extending from the main frame 20 of the slicing machine as shown in Figs. 1 and 2. The upper end of the screw 118 and the upper end of the bar 102 are held by a brace member 121 carried at its inner end by a post 122 supported on the end of the plate 24, as shown in Fig. 6. The lower end of the screw 118 carries a ratchet wheel 123 and arm 124 and is journaled on the end of the screw between the ratchet wheel 123 and the lower face of the bar 119. A spring pressed pawl 125 is pivoted on the arm 124 by a pivot pin 126 and a link 127 is pivotally connected with the end of the pin 126 projecting from the lower face of the pawl 125. The link 127 has its inner end pivoted at 128 to a crank arm 129 carried on a stud shaft 130 which is provided with a beveled gear 131 meshing with a beveled gear 132 on the end of the shaft 37, as shown in Fig. 4. By this arrangement the link 127 is reciprocated during the operation of the machine and the pawl 125 is thus caused to intermittently rotate the screw 118. The parts are so timed that the rotation of the screw takes place after a slice has been deposited upon the tray 110 by the fly 27 and the direction of the rotation of the screw is such that the tray is fed downwardly after each slice is deposited thereon. A cam guard or shroud 133 is provided for the ratchet wheel 123 to to regulate the amount of rotation of the screw 118 for each reciprocation of the pawl 125. The shroud 133 is carried on the lower end of a shaft 134 extending through a central opening in the screw 118. An adjusting lever 135 is secured to the upper end of the shaft 134 and is supported upon a bearing plate 136 carried on the upper face of the brace member 121. The lever 135 is provided at its end with an opening 137 having a ball ratchet 138 arranged to bear upon teeth 139 on the upper face of an arcuate flange 140 over which the end of the lever 135 moves when it is rotated about the axis of the screw 118 as a center. The ball 138 is resiliently held in contact with the teeth 139 by a spring 141 so that the lever may be swung about its pivotal center but is held by the ball ratchet and the teeth 139 in any position to which it is moved. A handle 142 is provided for moving the lever 135. It will be apparent that by setting the lever 135 in various positions the shroud 133 will be so set that the pawl 125 will produce any motion of the ratchet wheel 133 and the screw 118 that is desired. A graduated plate 143 is secured by the outer face of the flange 140 and an indicator finger 144 is carried on the end of the lever 135 and plays over the graduations on the plate 143 to indicate the amount the tray 100 will be fed by the

ratchet mechanism for each operation of the fly. Gradations on the plate 143 are preferably arranged to correspond with the gradations on the device for controlling the thickness of the slices formed by the slicing machine, so that the tray 100 may be set to move downwardly an amount corresponding to the thickness of the slices being formed by the machine. A spring friction block 145 is mounted to slide in an opening 146 and brace against the lower end of the screw 118. A coiled spring 147 presses the block 145 against the screw and the tension of the spring may be regulated by a threaded member 148. The spring block 145 prevents overthrow of the screw 118 under the action of the ratchet wheel 123.

It will be noted from Fig. 1 of the drawing that the ratchet mechanism for operating the tray 100 is located at the side of the tray adjacent the slicing knife 22 and away from the operating position of the machine, that is, away from the side of the machine at which the operator stands. This leaves the side of the tray 100 near the operating wheel 21′ free from obstruction so that the tray is easily accessible to the operator and also leaves the extreme outer edge of the tray opposite the slicing mechanism unobstructed. This arrangement makes it convenient to wrap the slices after they have been formed and to remove them for the customer, and also permits easy view of the stack of slices as it is being formed.

Beneath the tray 100 is a scrap pan 150 which may be supported at one edge by the screws 151 by which the rods 120 are held in place on the main frame 20. The opposite edge of the scrap pan 150 is supported by a pair of spring detents 152 having finger pieces 153 by which the detents may be retracted to permit easier removal of the scrap pan. The pan 150 intercepts any particles that may fall from the stacker and the slicing knife. The operation of the various parts has been outlined in connection with the description of the construction of the parts, so that a further detailed description of the operation is thought to be unnecessary. In general, however, it may be said that the meat or other material to be sliced is clamped upon the reciprocating table 23 in the usual manner and moved back and forth past the edge of the knife 22. Each time the table is moved into position away from the edge of the knife 22 it is fed forwardly by mechanism well known in the art to cause a portion of the material of desired thickness to project beyond the edge of the slicing knife so that a slice will be cut from the material on the next movement of the table. At the time that the material is being moved forwardly the pins 51 are in position adjacent the base of the material from which the slices are being cut so that the material is projected against the points of the pins which penetrate slightly into the portion of the material which will be severed to form the next slice. As the table is moved past the slicing knife the conveyer pins move in unison with the material and carry the slice as it is formed about the curve at the end of the conveyer and adjacent the inner face of the guard plate 85. The points of the pins project through the slots 86 in the guard plate 85, and because of the fact that the plate is slightly eccentric relative to the center of movement of the conveyer the slice will be pushed more firmly onto the points of the pins as the conveyer rounds the turn. At the end of the movement of the reciprocating table the conveyer is given a supplemental movement which brings it into the position shown in Fig. 7, with the slice held in a vertical position on the points of the pins and the fingers 28 of the discharge fly in the rear of the slice. While the conveyer is stationary at the end of its travel the fly is caused to rotate in a clockwise direction as viewed in Fig. 2 so that the slice is stripped from the points of the conveyer and swung downwardly into a horizontal position where it falls from the conveyer points onto the stack of slices which is being formed on the tray 100. After the slice has been deposited and while the fly is being returned to its upright position the screw 118 is partially rotated by the ratchet wheel 123 so that the tray 100 is fed downwardly an amount equal to the thickness of the slice deposited upon the tray. The height of the tray may be adjusted at any time by grasping the handle 116 and pressing the lever 114, leaving the tray free to be moved up or down along the standard 102 to any position desired by the operator. The amount of automatic adjustment may be regulated by shifting the handle 142. The entire frame carrying the conveyer and its associated parts may be easily removed by unfastening the two holding studs 72 which leaves the frame free to be lifted bodily from the slicing machine.

We claim:

1. In combination, a slicing machine comprising a rotary knife, a reciprocating table for presenting material to said knife to be sliced, a tray for receiving slices formed by said knife and feeding mechanism for moving said tray, said feeding mechanism being located at the side of said tray away from the operating position of said slicing machine.

2. In combination, a slicing machine comprising a relatively reciprocating knife and table for slicing material, a tray for receiving slices formed by said knife, and operating mechanism for said tray located at the

side of said tray adjacent said slicing knife and away from the operating side of said slicing machine.

3. In combination, a slicing machine comprising a relatively reciprocating knife and table for slicing material, and power mechanism including a rotary wheel for driving said knife and table, a tray for receiving slices formed by said knife, and feed mechanism for said tray located at the side of said tray away from said wheel to leave the side of said tray adjacent said wheel and the side of said tray away from said slicing machine free from obstruction.

4. The combination with a slicing machine, of a tray for receiving slices therefrom, a hollow feed screw for said tray, mechanism for operating said feed screw, and a rod extending through said feed screw for setting said operating mechanism.

5. The combination with a slicing machine, of a tray for receiving slices therefrom, an upright guide for said tray, a hollow feed screw for moving said tray along said guide, mechanism for rotating said screw, and means extending through said screw for regulating said rotating mechanism.

6. The combination with a slicing machine, of a tray for receiving slices therefrom, an upright guide for said tray, an upright feed screw for said tray having a longitudinal opening therethrough, a ratchet wheel for operating said feed screw, means for regulating the amount of movement of said ratchet wheel, a rod connected with said regulating means and extending through the opening in said feed screw, and a handle connected with said rod adjacent the end of said screw opposite the ratchet mechanism for moving said regulating means.

7. The combination with a slicing machine, of a tray for receiving slices therefrom, means for transferring slices from said machine to said tray, a single upright guide for maintaining said tray in horizontal position, and feed mechanism for adjusting said tray on said guide.

8. The combination with a slicing mechine, of a tray for receiving slices from said machine, mechanism for transferring slices from said machine to said tray, a single upright guide for maintaining said tray in horizontal position, means for automatically feeding said tray along said guide, and means for adjusting said tray along said guide independently of said automatic means.

9. The combination with a slicing machine, of a tray for receiving slices from said machine, mechanism for transferring slices from said machine to said tray, an upright guide for maintaining said tray in horizontal position, an elongated sleeve connected with said tray and movable on said guide, and rollers interposed between said guide and sleeve for preventing said sleeve from binding on said guide.

10. The combination with a slicing machine, of a tray for receiving slices therefrom, mechanism for transferring slices from said machine to said tray, an upright guide for said tray, rollers connected with said tray and bearing on said guide for maintaining said tray in horizontal position, and means for feeding said tray relative to said guide.

11. The combination with a slicing machine, of a tray for receiving slices therefrom, mechanism for transferring slices from said machine to said tray, a guide for said tray, rollers connected with said tray, and spaced from one another longitudinally of said guide for maintaining said tray in position normal to said guide, and feed mechanism for moving said tray along said guide.

12. The combination with a slicing machine, of a tray for receiving slices therefrom, mechanism for transferring slices from said machine to said tray, an upright guide for said tray, an elongated sleeve connected with said tray and movable along said guide for maintaining said tray in a horizontal position, a screw for feeding said tray along said guide, ratchet mechanism operated by said slicing machine for rotating said screw, means for shifting said tray relative to said guide independently of said screws, and a tooth member connected with said tray and movable into and out of engagement with said screw.

13. The combination with a slicing machine, of a tray for receiving slices therefrom, a feed screw for said tray, mechanism operated by said slicing machine for automatically operating said feed screw, means for regulating said operating mechanism to vary the amount of movement of said feed screw, a lever for shifting said regulating mechanism, and an index connected with said lever for indicating the amount of movement to be imparted to said tray for various positions of said hand lever.

14. In combination with a slice receiving tray, a feed screw for said tray, mechanism located at one end of said screw for operating said tray, and a device located at the opposite end of said screw for regulating said operating mechanism.

15. The combination with a slice tray, of a feed screw for operating said slice tray, having an opening extending longitudinally thereof, a ratchet wheel secured to one end of said feed screw for rotating said screw, a bar extending through said feed screw and having means thereon adjacent said

ratchet wheel for regulating the amount of movement imparted to said feed screw by said ratchet wheel, and means connected with the opposite end of said bar for adjusting said regulating means.

16. The combination with a slice tray, of a feed screw for operating said tray having an opening extending longitudinally therethrough, a ratchet wheel connected with one end of said tray, a pawl for operating said ratchet wheel, a bar extending through the opening in said feed screw, a shroud connected to said bar adjacent said ratchet wheel for controlling said pawl, a handle connected with said bar adjacent the end of said screw opposite said ratchet wheel, a detent for holding said handle in adjusted positions, and an index for indicating the amount of movement imparted to said tray by the feed screw for various positions of said handle.

17. In combination with a relatively reciprocating knife and table of a slicing machine, of a tray for receiving slices formed by said knife, mechanism interposed between said knife and tray for depositing slices on said tray, mechanism for feeding said tray located at the side thereof adjacent said knife and away from the operating side of said slicing machine to leave the side of said tray adjacent the operating side of said slicing machine and the side of said tray opposite said slice depositing mechanism free from obstruction.

18. The combination with a slicing machine, of mechanism for receiving slices therefrom, said mechanism comprising a conveyer and a frame for supporting said conveyer, said frame having conveyer guides thereon formed of plates with the edges thereof extending at right angles to the planes of said plates to constitute guides for said conveyer.

19. The combination with a slicing machine, of a stacker for receiving slices therefrom, said stacker comprising a frame consisting of spaced plates having the edges thereof offset to form conveyer guides.

20. The combination with a slicing machine, of a stacker for receiving slices therefrom, said stacker comprising a pair of plates having their edges bent to form spaced guides, and means for holding said plates to maintain said guides in fixed relation relative to one another.

21. In a stacker for slicing machines, a frame comprising plates having their edges shaped to form guides, means for holding said plates in spaced relation relative to one another, and a slice conveyer movable in said guides.

22. In a stacker for slicing machines, a pair of plates secured together in parallel relation to one another and having their edges shaped to form spaced guides, and a slice conveyer movable in said guides.

23. A stacker for slicing machines, comprising a pair of oppositely disposed frame members, spacing bars for holding said frame members in position relative to one another, each of said frame members comprising a pair of plates secured to said spacing bars in parallel relation to one another, said plates having their edges bent to form space guides, and a slice conveyer movable in said guides.

24. A stacker for slicing machines, comprising a pair of frame members, means for holding said frame members in spaced relation relative to one another, each of said frame members comprising a pair of plates secured to said holding means with the face of one plate in contact with the face of its companion plate, and with the edges of said plates disposed at an angle relative to said plates, one of each of said pairs of plates being larger than the other so that said angularly disposed edges will be spaced from one another to form a guide channel, and a slice conveyer having guide members movable in said guide channels.

25. The combination with a slicing machine, of a stacker frame comprising means for maintaining the parts of said frame in assembled relation independently of said slicing machine, and means for detachably securing said frame to said machine.

26. The combination with a slicing machine, of a stacker frame for said machine, said stacker frame comprising means for maintaining the parts thereof in assembled relation independently of said slicing machine, and a pair of centering screws for detachably securing said frame to said slicing machine.

27. The combination with a slicing machine, of a stacker frame therefor comprising guide plates, spacing bars for holding said guide plates in fixed position relative to one another, a slice conveyer movable in said guide plates, and centering screws for detachably securing said stacker frame to said slicing machine.

28. The combination with a slicing machine, having a main frame, a supporting plate secured to said main frame, a self contained stacker frame having a conveyer thereon, and centering screws for detachably securing said stacker frame to said supporting plate.

29. The combination with a slicing machine, of a stacker frame therefor, said frame comprising oppositely disposed guide members each of which comprises a pair of plates having the edges thereof shaped to form spaced guides, said plates being held together by spacing bars which hold said pairs of plates in spaced relation relative to

one another, and screws extending through the plates of one of said pairs for detachably securing said stacker frame to said slicing machine.

30. The combination with a slicing knife and means for presenting material thereto to be sliced, of mechanism for receiving slices formed by said knife, means for intercepting particles of the material, and a device for clearing said intercepting means of said particles.

31. The combination with a slicing knife and a reciprocating table for presenting material to said knife to be sliced, a trough for receiving particles of material disconnected by said knife, and a follower arranged to travel in said trough and clear said trough of said material.

32. The combination with a slicing knife, of a device for receiving slices formed by said knife, a guideway for intercepting particles dislodged from the material being sliced, and means for clearing said particles from said trough.

33. The combination with a slicing knife and mechanism for presenting material to said knife to be sliced, of conveying mechanism for receiving slices formed by said knife, a trough for intercepting particles other than said slices dislodged from the material being sliced, and a follower arranged to follow in said trough to clear said trough of said material.

34. The combination with a slicing machine, of a conveyer for transferring slices away from said machine, a trough positioned beneath said conveyer for intercepting particles dislodged from the material being sliced, and means for clearing said trough of the material intercepted thereby.

35. The combination with a slicing machine, of a stacker for receiving slices therefrom, and means for intercepting particles of material other than said slices dislodged from the material being sliced.

36. The combination with a slicing machine, of a stacker therefor, comprising a slice conveyer, a trough positioned beneath said conveyer and shaped to conform to the path of said conveyer, and a follower movable with said conveyer for clearing said trough of material received thereby.

37. The combination with a slicing machine, of a conveyer for receiving slices therefrom, said conveyer comprising a chain having flat triangularly shaped links connected to one another at two of the apexes of said links, and having slice carriers secured to said links at the third apex of said links.

38. The combination with a slicing machine, of a conveyer for receiving slices therefrom, said conveyer comprising a pair of spaced chains, each chain being made up of triangularly-shaped links pivoted together adjacent two of the apexes of said links, and slice carrying bars connected to the remaining apexes of said links and extending from one of said chains to the other.

39. The combination with a slicing machine, of a conveyer comprising a chain having a plurality of flat links, means for guiding said chain in a curved path, said links having portions thereof extending laterally therefrom with one face thereof arranged to slide upon an adjacent face of a coöperating link when said chain is moved about the curve in its path of travel.

40. A slicing machine, comprising a conveyer for receiving slices, said conveyer comprising a pair of chains, each having a plurality of flat triangularly-shaped links connected to one another adjacent the corners of said links, with one corner of each link extending laterally from said chain, alternate links of each chain being arranged in different planes so that adjacent faces of said links will slide upon one another when said chain moves about a curve in its path of travel, slice carrying bars connecting the laterally extending corners of the links of one of said chains with the corresponding portions of the links of the other of said chains, and slice engaging pins connected with said bars extending toward the plane of the pivotal connections between the links of said chains.

41. The combination with a slicing machine, of a conveyer for receiving slices therefrom, said conveyer comprising a chain having the links thereof formed of triangularly shaped flat plates pivotally connected to one another at two of the corners of each of said links, with the third corner of each link extending laterally from said chain, alternate links of said chain being arranged in different planes so that adjacent faces of alternate links will slide upon one another when said chain moves about a curve in its path of travel, wear plates connecting the pivots of alternate links, and a guide for directing the path of movement of said chain and for engaging said wear plates.

42. The combination with a slicing machine, of a conveyer for receiving slices therefrom, said conveyer comprising a pair of chains, each having a plurality of triangularly-shaped flat links connected to one another at two corners of each link, with the third corner of each link extending laterally from said chain, bars connecting the laterally extended corners of the links of one of said chains with the corresponding portions of the other of said chains, slice engaging pins carried by said bars and extending toward the plane of the pivotal connections between the links of said chains, a channel guide for each of said chains, means

at the pivotal connections between the links of said chains arranged to travel in said channel guides for directing the movement of said chain, and wear plates connected with the pivots of alternate links of said chains and having sliding connection with said channel guides.

43. The combination with a slicing knife, of a conveyer for receiving slices from said knife, a guard for coöperating with said conveyer, and means for adjusting said guard relative to said conveyer and slicing knife.

44. The combination with a slicing knife, of a conveyer for receiving slices therefrom and for transferring said slices away from said knife in a curved path, a curved guard for coöperating with said conveyer adjacent said curved path, and means for adjusting said guard in the direction of said curved path and toward and away from said slicing knife.

45. The combination with a slicing knife, of a conveyer for transferring slices from said knife, said conveyer having pins thereon arranged to pierce said slices, means for guiding said conveyer in a curved path away from said slicing knife, a curved guard for directing the slices about the curve in the path of said conveyer, said guard having slots therein for receiving the pins on said conveyer, and means for adjusting said guard relative to said conveyer to properly position the slots in said guard.

46. The combination with a slicing knife, of a conveyer for transferring slices from said knife, means for guiding said conveyer in a curved path away from said knife, a guard for coöperating with said conveyer, and means for supporting said guard for adjustment about an axis approximately coincident with the center of curvature of the path of said conveyer.

47. The combination with a slicing knife, of a conveyer for receiving slices from said knife, means for directing said conveyer in a curved path away from said knife, a curved guard arranged to coöperate with said conveyer adjacent the curve in its path of movement, pins on said conveyer for entering slices carried thereby, said guard having slots therein in which said pins travel, said guard being mounted for adjustment transversely of said slots to position said slots relative to the path of said pins, and means for supporting said guard for adjustment about an axis substantially coinciding with the center of curvaure of the path of said conveyer to permit said guard to be moved toward and away from said knife.

48. The combination with a circular slicing knife, of a guard having one edge thereof shaped to conform to the curvature of said knife, said guard being curved to direct slices away from said knife, and means for supporting said guard for adjustment toward and away from said knife.

49. In a slicing machine, a conveyer, a curved guard for said conveyer, said guard having slots therein, and means for adjusting opposite ends of said guard in different directions to vary the angular position of the slots in said guard.

50. The combination with a slicing knife, of a conveyer for transferring slices away from said knife, a curved guard arranged to coöperate with said conveyer, said guard having slots therein, means for adjusting said guard transversely of said slots, and means for adjusting opposite ends of said guard independently of one another to vary the angular position of said slots.

51. The combination with a slicing knife, of a conveyer for transferring slices from said knife, a curved guard coöperating with said conveyer and knife, said guard comprising a relatively thin sheet of metal having one edge thereof rolled for stiffening said guard.

52. The combination with a slicing machine, of mechanism for receiving slices therefrom and depositing said slices in stack formation, said mechanism comprising a fly having fingers thereon of sheet material curved in cross-section so that said fingers will present the edge of said material to the slice engaged thereby.

53. The combination with a slicing machine, of mechanism for receiving slices therefrom and depositing said slices in stack formation, said mechanism comprising a fly having fingers for engaging said slices, said fingers being formed of sheet metal substantial semicircular in cross-section, the ends of said fingers being flattened and curved to direct the slices into position relative to said fly.

54. The combination with a slicing machine, of mechanism for receiving slices therefrom and depositing said slices in stack formation, said mechanism comprising a fly having a plurality of fingers thereon, each finger formed of sheet material substantially semicircular in cross-section, and a clamp for holding said fingers in position on said fly, said clamp having portions thereof shaped to conform to the shape of said fingers for engaging said finger and holding them in fixed position on said fly.

55. The combination with a slicing machine, of a main drive shaft therefor, a yoke having a supplemental shaft journaled therein, said yoke having bearing members journaled on said main drive shaft, intermeshing gears for driving said supplemental shaft from said main drive shaft, and mechanism operated by said supplemental shaft

for discharging slices from said slicing machine.

56. A slicing machine, comprising a main drive shaft, a yoke having supplemental shaft journaled therein, arms connected with said yoke and journaled on said main drive shaft, spur-gears for driving said supplemental shaft from said main drive shaft, a cam connected with said supplemental shaft, a reciprocating arm operated by said cam, and means operated by said arm for discharging slices from said slicing machine.

57. A conveyer, comprising a main drive shaft, a supplemental shaft operated by said main drive shaft, mechanism operated by said supplemental shaft for discharging slices formed by said slicing machine, a tray for receiving said slices, and mechanism operated by said supplemental shaft for automatically adjusting the position of said tray.

58. The combination with a slicing machine, having a main drive shaft, of a yoke having a supplemental shaft journaled therein, arms connected with said yoke and journaled on said main drive shaft, a single screw for holding said yoke in fixed position relative to the frame of said slicing machine, mechanism operated by said supplemental drive shaft for discharging slices from said slicing machine, a tray for receiving slices from said discharging mechanism, and feeding mechanism operated by said supplemental drive shaft for automatically adjusting the position of said tray to receive said slices.

59. The combination with a slicing machine, of mechanism for discharging slices therefrom, a scrap pan for receiving particles detached from the material being sliced, and means for detachably holding said scrap pan in position beneath said slice discharging mechanism.

60. The combination with a slicing machine, of mechanism for receiving slices therefrom and depositing said slices in stack formation, and a scrap pan positioned beneath said mechanism and detachably held in place for receiving particles of the material being sliced other than said slices.

61. The combination with a slicing machine, of a reciprocating fly for discharging slices therefrom, and a pair of cams for positively moving said fly in both directions of reciprocation thereon.

62. The combination with a slicing machine, of a reciprocating member for discharging slices therefrom, a reciprocating rod for operating said member, a pair of cams for positively moving said rod in each direction of reciprocation thereof, and a common drive shaft for operating said cams.

In testimony whereof we have signed our names to this specification on this 29th day of August, A. D. 1919.

AUGUST R. LUSCHKA.
JOSEPH FOLK.