April 9, 1940. J. FOLK 2,196,725

SLICING MACHINE MECHANISM

Filed Feb. 15, 1936 4 Sheets-Sheet 1

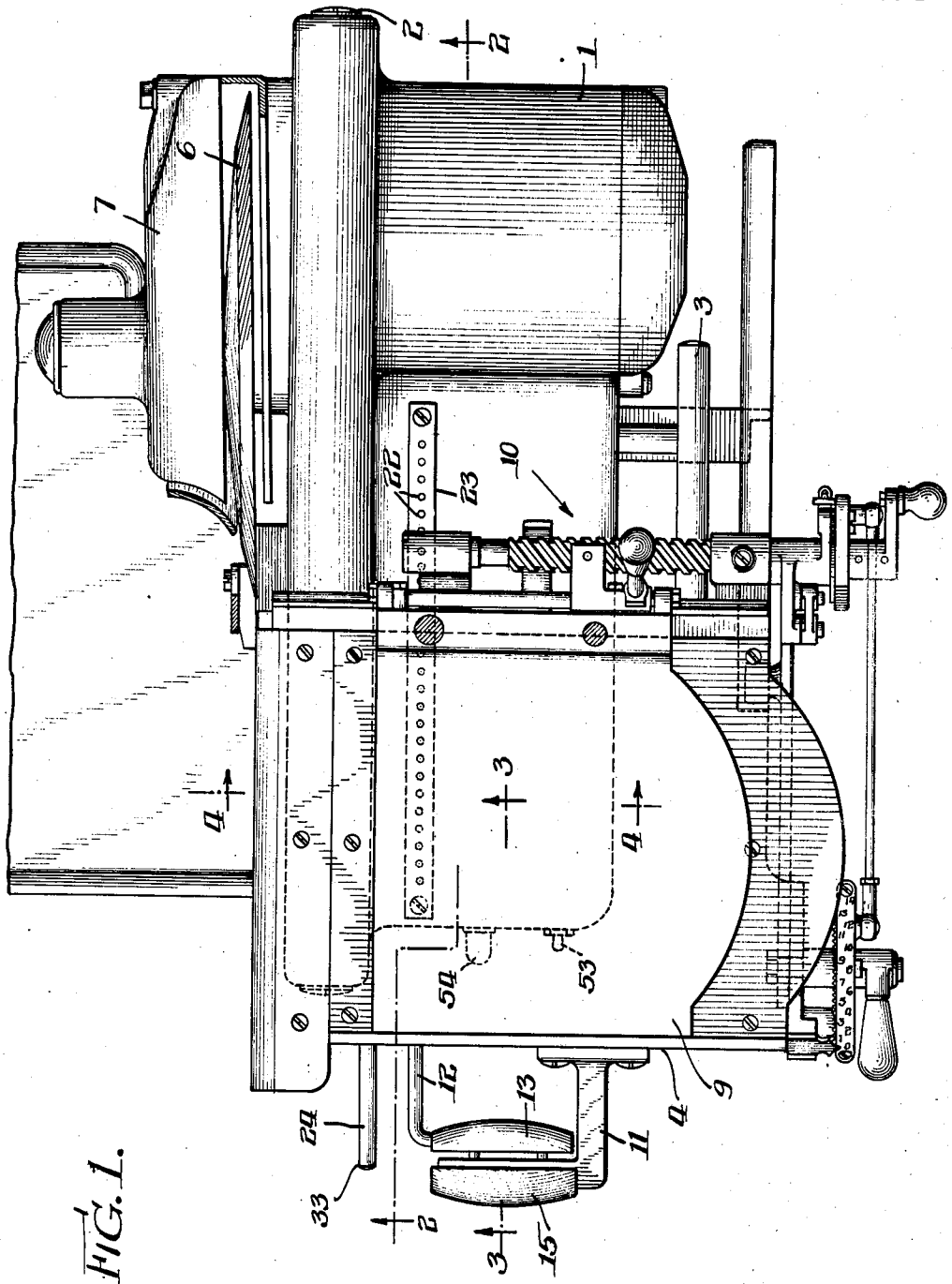


FIG. 1.

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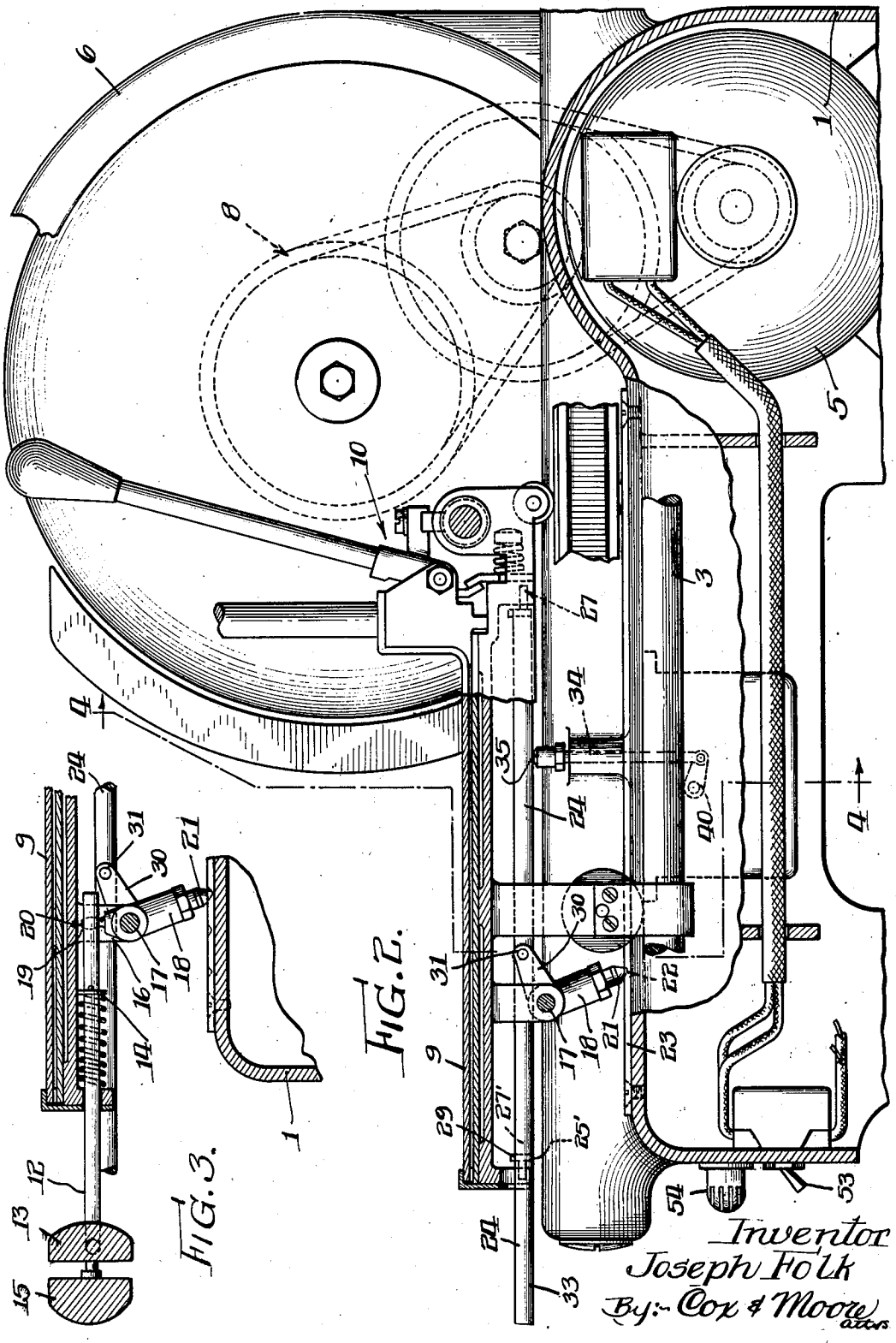


FIG. 2.

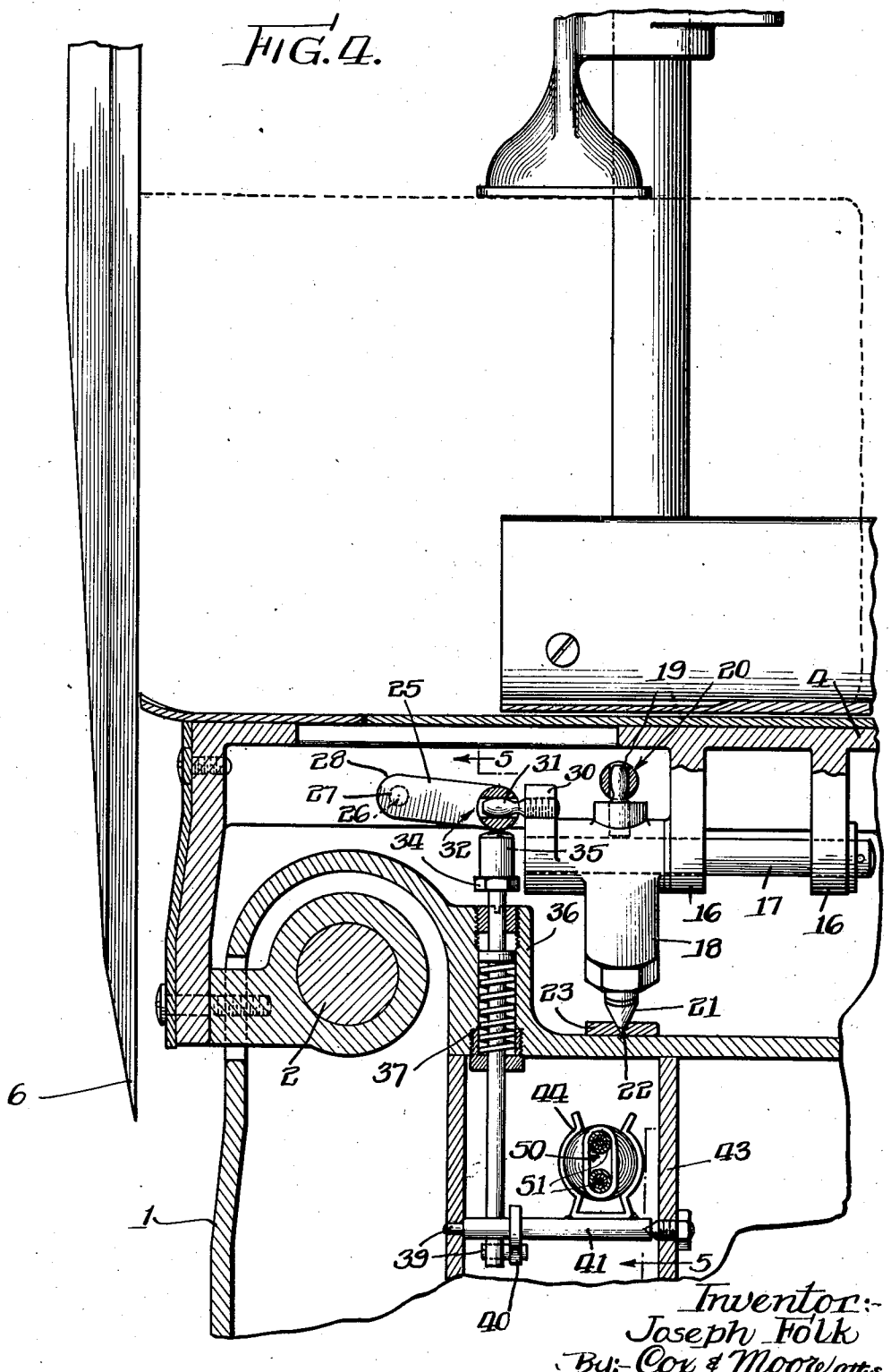
FIG. 3.

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FIG. 4.



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SLICING MACHINE MECHANISM

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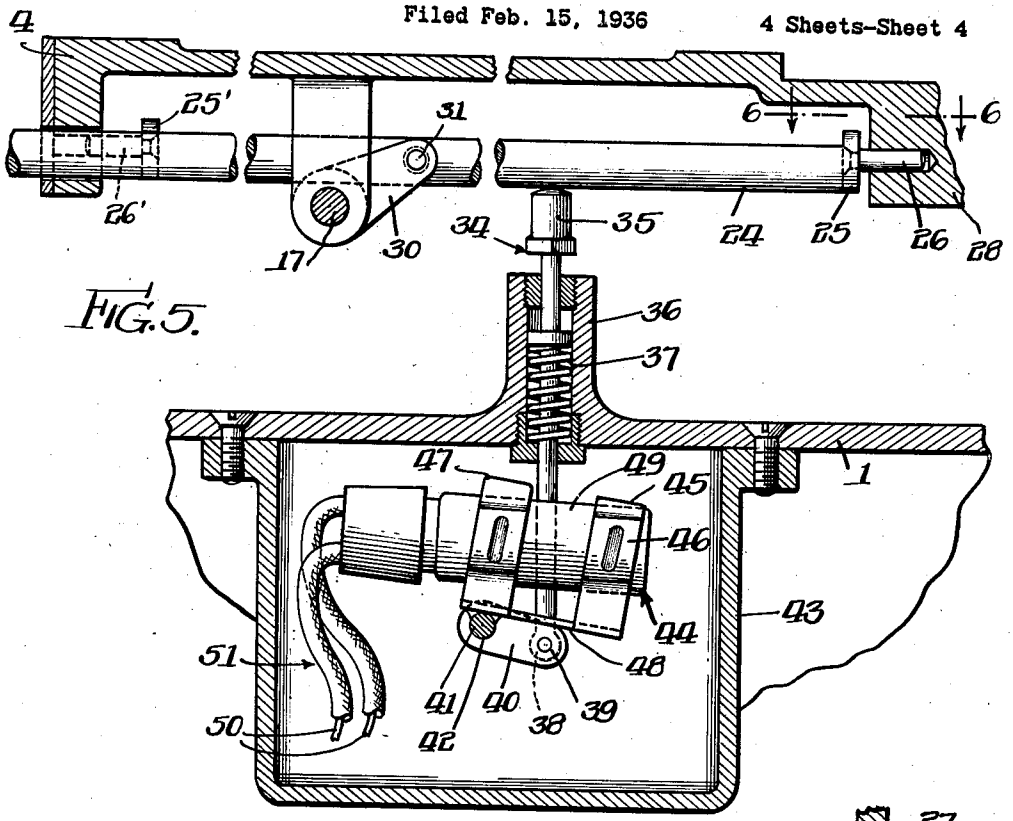


FIG. 5.

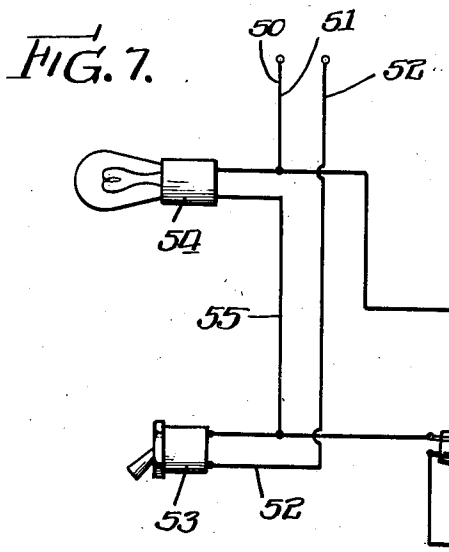


FIG. 7.

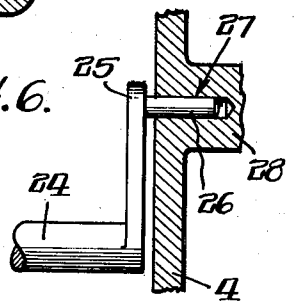


FIG. 6.

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Patented Apr. 9, 1940 2,196,725

UNITED STATES PATENT OFFICE

2,196,725

SLICING MACHINE MECHANISM

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Application February 15, 1936, Serial No. 64,146

10 Claims. (Cl. 146—102)

This invention relates to slicing machines and particularly for mechanism therefor. More specifically the invention relates to a slicing machine having a manually reciprocating carriage and an electrically driven knife.

The primary object of the invention is to provide a slicing machine having a stationary but rotatably mounted knife electrically driven and a manually reciprocal carriage, there being control means to prevent reciprocation of the carriage and rotation of the knife but permitting reciprocation of the carriage and rotation of the knife upon manual operation of said means.

A further object of the invention is the provision of a reciprocal carriage having stop means to prevent movement of the carriage in a forward direction in combination with releasable means for releasing said stop to permit movement of the carriage; means are also operatively connected with said releasable means whereby rotation of the knife is effected only upon manipulation of said releasable means and when the carriage is released.

A further object of the invention is to provide a slicing machine having a carriage with an operating handle and a stop member operated by a part of said handle whereby the carriage can only be moved in a forward or cutting direction upon proper manipulation of the handle.

Another object of the invention is the provision of a carriage having an operating handle and electrical connections to the handle whereby the handle upon proper operation thereof causes operation of the electrical means for causing rotation of a slicing machine knife.

A further object of the invention is the provision of a reciprocal carriage and a stationary rotatably mounted knife with electrical connections therebetween for permitting operation of the knife and carriage; the electrical connections comprising conductors leading to a motor which drives the knife, a switch for effecting electrical connection to the electrical means upon operation of the switch, a pilot light to designate whether or not the current is on, and manually controlled means for releasing the carriage and for operating a mercury switch to effect the electrical connection to the motor.

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 top plan view of a preferred form of slicing machine and embodying the invention;

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

Fig. 3 is a detail longitudinal sectional view on the line 3—3 of Fig. 1;

Fig. 4 is a detail transverse sectional view on the line 4—4 of Fig. 1;

Fig. 5 is a detail vertical sectional view on the line 5—5 of Fig. 4;

Fig. 6 is an enlarged detail sectional view on the line 6—6 of Fig. 5;

Fig. 7 is a diagrammatic or schematic view showing the electrical connections.

The particular slicing machine herein shown for the purposes of illustration comprises a base 1 having longitudinal side bars or rails 2 and 3 upon which there is mounted for fore and aft reciprocation a carriage 4. A motor 5 is housed within the base supporting structure 1, as clearly shown in Fig. 1, and drives a stationary but rotatably mounted knife 6 which is operatively supported on a knife supporting bracket 7. The knife 6 is driven by the motor 5 through a train of gears or pulleys indicated generally by the numeral 8, Fig. 2.

A substance support 9 is operatively mounted above the top of the carriage 4 to feed substance to the knife during manual reciprocation of the carriage. Feeding mechanism 10 is provided to feed the substance progressively to the cutting plane of the knife during operation of the carriage. This feeding mechanism is disclosed and claimed in applicant's Patent 2,136,792, granted November 15, 1938.

A handle 11, Fig. 1, is rigidly connected to the carriage to reciprocate the carriage forwardly and rearwardly in a rectilinear path parallel to the cutting plane of the knife. A longitudinal rod or bar 12 is slidingly supported in a part of the carriage frame and is provided with a grip portion 13. A spring 14, Fig. 3, surrounds the rod 12 and urges the portion 13 away from the handle grip portion 15 of the handle member 11. A bracket 16 extends downwardly from a part of the carriage, Fig. 4, and pivotally supports a cross bar 17, Fig. 4, upon which there is rigidly mounted a fitting 18. A pin 19, Fig. 4, is rigidly carried by the fitting 18 and extends into a receiving opening 20 provided in the rod 12. A stop point or plug 21 is mounted in the lower end of the fitting 18 and is adapted to engage any one of the series of openings or recesses 22 formed in a longitudinal bar or strip 23 fixed to the upper face of the base, Figs. 1 and 4. The plug 21

is normally urged downwardly against the strip 23 and particularly in a recess 22 thereof. Forward pressure on the handle 15 thereby is prevented from moving the carriage forwardly because the plug 21 would be engaged by the recess 22. In order to permit the carriage to be moved in a forwardly direction the plug 21 must be disengaged from a recess 22, and this is done by moving the rod 12 rearwardly toward the operator's stance. The portion 13 on the rod 12 is arranged in juxtaposition relatively to the handle grip portion 15 so that the two parts 13 and 15 may be conveniently operated as a unit and as a single grip. By gripping the two parts 13 and 15 the part 13 is moved toward the part 15 which imparts longitudinal movement of the rod 12 in a direction toward the operator and against the tension of the spring 14. When the rod 12 is moved rearwardly, that is toward the operator, by squeezing the portions 13 and 15, the fitting 18 is caused to swing on its pivot 17 and release the plug 21 from a recess 22 in the strip 23. The carriage is thereby permitted to be freely operated. The advantage of this stop mechanism for the carriage is to insure safe loading of the machine as the carriage is locked in a predetermined position and movement thereof is prevented unless the grip 13 or rod 12 is purposely operated.

It will be noticed, however, that the plug and its fitting 18 extend forwardly in an angular position so that forward movement of the carriage is positively prohibited unless the plug is retracted from its receiving notch 22. The carriage even though being frictionally locked is capable of being moved rearwardly, that is toward the operator, because the plug will be relatively free to slide over the various notches 22 in the strip 23. However, in loading, the thrust against the machine is generally, if not always, forwardly, and forward movement of the carriage is prevented unless the grip 13 or rod 12 is purposely manipulated by the operator.

The knife 6 is of the rotary type and while being rigidly mounted is free to rotate in one direction during operation of the motor 5. It is desirable that the motor and consequently the knife be not operated unless it is intentionally desired to do so. Therefore, means are provided to prevent rotation of the knife except when the carriage is being operated. Means for causing or preventing rotation of the knife is also determined by manipulation of the grip portion 13 and its cooperating rod 12.

A longitudinal rod or bale 24 has its forward or front end provided with an angularly disposed leg 25 to which a stud or pivot 26 is rigidly attached. The stud or pivot is pivotally supported in a slot or recess 27 formed in a bearing 28 on a part of the carriage 4. The forward end of the rod 24 has a fitting 29 fixed thereto which is likewise pivotally mounted in a suitable bearing provided in the carriage frame. An arm or link 30 rigidly connected to the fitting 18 carries a pin 31, Figs. 2 and 4, which is received within a slot 32, Fig. 4, formed in the longitudinal rod or bale 24. The projecting end of the rod 24 extends outwardly from the end of the machine a predetermined distance as indicated at 33, Figs. 1 and 2, for a purpose which will later appear.

A plunger 34 has a cap 35 which is adapted to bear against the lower side of the rod 24 regardless of the position of the carriage. This plunger extends through a fitting 36 formed on part of the frame 1 and a spring 37 is adapted to urge the plunger upwardly so that the cap 35 will be in constant engagement with the longitudinal rod 24, Figs. 4 and 5. The lower end of the plunger 34 and which comprises the rod 38 is pivotally connected as indicated at 39 to a link 40 which has its other end rigidly connected to a cross shaft 41 as indicated at 42, Fig. 5. The shaft 41 is pivotally mounted in a switch box 43, Figs. 4 and 5, which is rigidly connected to a part of the main frame 1.

The member 34, Figs. 4 and 5, may be adjustable so as to permit lengthening thereof. To carry out this adjustable feature, the cap 35 may be screw threaded and then locked in adjusted position by a set screw (not shown). Any other adjustable means, such as a screw (not shown) threaded into the cap 35, may be used to effect this adjustment.

A mercury switch 44 is mounted in the switch box 43 and comprises a supporting element 45, the supporting element comprising pairs of spaced supporting arms 46 and 47 connected across their bottoms by a rigid strip 48. The mercury switch 44 comprises a tube 49 which is supported by the member 45, which member in turn is rigidly supported on the cross shaft 41. Electric connectors 50 are electrically connected to the mercury tube 49 and lead to the motor 5 and to a source of electric supply, Figs. 4, 5, and 7. The connectors 50 are part of an electrical conductor 51 through which current is received. A second electrical conductor 52 also leading from a source of supply is connected along with the electrical conductor 51 to a switch 53. The conductor 52 is also electrically connected to the motor 5, there being an electric light 54 connected in parallel to the circuit. Thus current coming in through the conductors 51 and 52 is ultimately delivered to the motor 5. The conductor 51 leads from a source of supply to one side of the switch 53 and then from the other side of the switch 53 to the mercury tube 49, and then to the motor 5, the mercury switch being interposed within the conductor line, and comprises the two aforesaid connectors 50. The electrical conductor 52 leads from a source of supply to the lamp or pilot light 54 and then directly to the motor 5. A connector 55 connects the pilot light 54 to the switch 53 as clearly shown diagrammatically in Fig. 7. To complete the circuit to the motor 5, therefore, it is necessary to operate the switch 53 and then the mercury switch 44. When the switch 53 is operated to bring current to the electrical operating mechanism the pilot light 54 will be lighted thereby indicating positively to the operator that the current is on. However, the motor is not yet electrically connected and therefore the slicing knife will not rotate. However, when the grip 13 is moved to the left, Fig. 1, such as by squeezing the same toward the companion part 15, the fitting 18 will be caused to swing on its pivot and when it does so the plug 21 will be released from a recess 22 in the strip 23. The squeezing of the two parts 13 and 15 of the handle which causes longitudinal movement of the rod 24 to swing the fitting 18 on its pivot causes the connecting arm or link 30 to swing the rod or bale 24 on its pivots 28 and 29, raising the same upwardly. This raising movement of the member 24 permits the spring 37 to raise the plunger 34 upwardly. The raising of the plunger rod 34 causes the link 40 to turn the cross rod 41, Figs. 4 and 5, and tilt the position of the mercury tube from the position shown in full lines, Fig. 5, to the position shown in dotted lines. When the

mercury tube has assumed the position shown in dotted lines in Fig. 5 the mercury of course will run to the lower end and cause a connection to be made between the formerly exposed connectors 50, thereby completing the circuit to the motor. Thus when the grip 13 is moved rearwardly toward the operator and against the handle grip portion 15 the mercury switch is caused to complete an electrical connection to the motor as well as causing the plunger to be retracted from a receiving stop recess 22.

To permit free, easy and positive operation of the bale 24 the end 29 thereof, Fig. 2, comprises a rigid arm 25' having an opening therein, into which opening there is received a pin 27'. This construction allows for a part sliding as well as rotary movement and causes free, easy and positive operation of the bale. Regardless of the position of the bale, whether the same is in its up or raised position during the running of the knife or whether it is in its lowered position, the cap or end 35 will always be engaged with the bottom edge of the bale 24 and inasmuch as the end of the carriage normally travels a predetermined distance beyond the plunger 27 the extending end 24 will still be engaged with the plunger head 35 to maintain the parts in their electrical relationship. In other words if the rod 24 did not have the elongated end 33 thereon the carriage, when it is pushed farthest away from the operator, would have no contact or engagement with the plunger element 34 but by providing the extension 33 on the arm, the plunger head 35 will be maintained in its proper electrical position at all times regardless of the position of the carriage.

The invention provides a manually reciprocal carriage with a rotatably mounted knife which is kept from rotating except when it is purposely desired to cause rotation thereof. This construction provides a positively safe machine, using power only when it is intended to operate the knife. This construction also permits for safe loading as the knife is at a stand-still when the machine is being loaded. Further, it is very desirable that the slicing machine supporting clamp and the substance be removed as far as possible from the knife during the sharpening of the knife. The carriage can therefore be moved to any desirable position such as at the end of its extreme movement toward the operator, to remove the substance as far away as possible from the grinding stones. It is necessary during the sharpening operation that the operator have one hand on the grip 13, 15 to cause rotation of the knife as well as use the other hand on the sharpening mechanism. Therefore there is hardly any chance of the operator becoming cut or hurt during the sharpening operation.

The present slicing machine, therefore, is economical in that it uses current for the motor only when it is purposely desired to cause rotation of the knife. The operator is always advised as to whether or not the current is on because of the existence of the pilot light. Furthermore, the machine is safe in that any body pressure against the part 15 will have no effect upon the operation of the machine as the parts can only be released by the moving of the part 13 toward the operator and this is accomplished by squeezing the part 13 toward the part 15. Safe loading is assured because all the parts are stationary and there is very little if no danger at all of the operator becoming injured in any stage of the operation. The knife only rotates when it is the purpose of the operator to effect its rotation.

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.

What I claim is new and desire to secure by Letters Patent of the United States is:

1. A slicing machine comprising a base, a carriage slidable above said base in a rectilinear path, a stationary revolubly mounted knife, a motor, means operated by the motor for driving the knife, a switch mounted on said slicing machine, conductors leading from a source of power and operatively connected to said switch, electric connectors leading from said switch to said motor, a switch interposed in at least one of said connectors between said first named switch and said motor, means for operating said last named switch independently of said first named switch, and a pilot light mounted on said machine and receiving current from said conductors at all times when said first named switch is on.

2. A slicing machine comprising a fixed rotatably mounted knife, a base, a knife supporting bracket connected to said base and supporting said knife, guide rods carried by the base, a carriage mounted on said guide rods to permit manual movement of said carriage on said guide rods in a rectilinear path including reciprocating movement in a path parallel to the plane of the knife, a motor, means driven by the motor for rotating said knife, conductors leading to a source of supply to the slicing machine, a switch on the machine and connected to said conductors, electric connectors leading from said switch to said motor, a mercury switch interposed between one of said connectors, a pilot light, means electrically connecting the pilot light to the first named switch and to one of said connectors whereby at all times to indicate whether or not the switch is on or off, locking means for the carriage, and means controlled co-incidentally with said locking means for actuating the mercury switch and consequently the knife.

3. A slicing machine comprising a base, a stationary revolubly mounted knife on said base, a carriage slidably mounted on said base for reciprocatory movement in a plane parallel to the plane of the knife, a motor, means operated by the motor for driving the knife, electrical connections to the motor, said electrical connections including a switch, means to permit manual actuation of said carriage in said reciprocatory path, and means for causing actuation of the switch to control the motor when the carriage is manually actuated, said last named means comprising a manual control handle operatively connected with the carriage for manual actuation thereof and control means mounted on said handle and operatively connected with said switch for actuating said switch when the handle is grasped for operation.

4. A slicing machine comprising a base, a stationary revolubly mounted knife on said base, a carriage slidably mounted on said base for reciprocatory movement in a plane parallel to the plane of the knife, a motor, means operated by the motor for driving the knife, electrical connections to the motor, said electrical connections including a switch and a mercury switch interposed between said first named switch and said

motor, means to permit manual actuation of said carriage in said reciprocatory path, and means for causing actuation of the mercury switch to control the motor when the carriage is manually actuated, said last named means comprising a manual control handle operatively connected with the carriage for manual actuation thereof and control means mounted on said handle and operatively connected with said switch for actuating said switch when the handle is grasped for operation.

5. A slicing machine comprising a base, a stationary revolubly mounted knife on said base, a carriage slidably mounted on said base for reciprocatory movement in a plane parallel to the plane of the knife, a motor, means operated by the motor for driving the knife, electrical connections to the motor, said electrical connections including a switch and a mercury switch interposed between said first named switch and said motor, means to permit manual actuation of said carriage in said reciprocatory path, locking means for locking the carriage in any pre-selected position, and means for controlling the operation of the locking means and for causing actuation of the mercury switch to control the motor when the carriage is manually actuated, said last named means comprising a manual control handle operatively connected with the carriage for manual actuation thereof and control means mounted on said handle and operatively connected with said switch and said locking means for actuating said switch and said locking means when the handle is grasped for operation.

6. A slicing machine comprising a rotatably mounted slicing knife, actuating means for causing rotation of the knife, a carriage mounted adjacent the knife for movement in a substantially rectilinear path generally parallel to the plane of said knife, means for manually actuating the carriage in said path, means for locking the carriage against movement in any of a plurality of positions in said path, means operatively connected to said locking means and operated thereby for preventing actuation of the actuating means for rotating the knife when the carriage is locked, and means associated with said manual control means for releasing said locking means, said means for preventing actuation of the actuating means being actuable upon release of said lock releasing means for causing rotation of the knife.

7. A slicing machine comprising a rotatably mounted knife, driving means actuable for causing rotation of the knife, a carriage mounted adjacent said knife for reciprocating movement in a plane substantially parallel to the plane of the knife, locking means operatively co-acting with said carriage for locking the carriage in any of a plurality of positions intermediate of its reciprocatory path for preventing movement of the carriage in a predetermined direction, means for manually actuating the carriage in said reciprocatory path, and means connected with said manual means for preventing actuation of the said knife driving means when the carriage is locked, said actuation preventing means being operatively connected to said locking means and actuated to operative position when the locking means is selectively operated for preventing movement of the carriage.

8. A slicing machine comprising a rotatably mounted knife, driving means for actuating said knife, a carriage slidably mounted adjacent said knife for reciprocating movement in a plane parallel to the plane of the knife, manual means for reciprocating the carriage in said path, locking means having interconnection with said carriage for locking the carriage in any of a plurality of predetermined positions in said path, means mounted on said manual means for releasing the locking means, and control means for operating said knife actuating means, said control means being connected to said lock releasing means and controlled by the actuation thereof for releasing the locking means for causing rotation of the knife when the locking means is released.

9. A slicing machine comprising a rotatably mounted knife, driving means for actuating said knife, a carriage slidably mounted adjacent said knife for reciprocating movement in a plane parallel to the plane of the knife, manual means for reciprocating the carriage in said path, locking means having interconnection with said carriage for locking the carriage in any of a plurality of predetermined positions in said path, means mounted on said manual means for releasing the locking means, and control means for operating said knife actuating means, said control means being connected to said lock releasing means and controlled by the actuation thereof for releasing the locking means for causing rotation of the knife when the locking means is released, said knife control and actuating means comprising an electrically driven motor and a switch controlling the operation of the motor.

10. A slicing machine comprising a rotatably mounted knife, driving means for actuating said knife, a carriage slidably mounted adjacent said knife for reciprocating movement in a plane parallel to the plane of the knife, manual means for reciprocating the carriage in said path, locking means having interconnection with said carriage for locking the carriage in any of a plurality of predetermined positions in said path, means mounted on said manual means for releasing the locking means, control means for operating said knife actuating means, said control means being connected to said lock releasing means and controlled by the actuation thereof for releasing the locking means for causing rotation of the knife when the locking means is released, said knife control and actuating means comprising an electrically driven motor, electric conductors leading from a source of supply and connected to the motor, and a mercury switch carried by the machine and interposed in at least one of said conductors at a point between the source of supply and the motor, said switch being connected to the lock releasing means for actuation therewith.

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