R. A. LANCEY.

CUTTING MACHINE.

APPLICATION FILED AUG. 14, 1907.

919,363.

Patented Apr. 27, 1909.

5 SHEETS—SHEET 1.

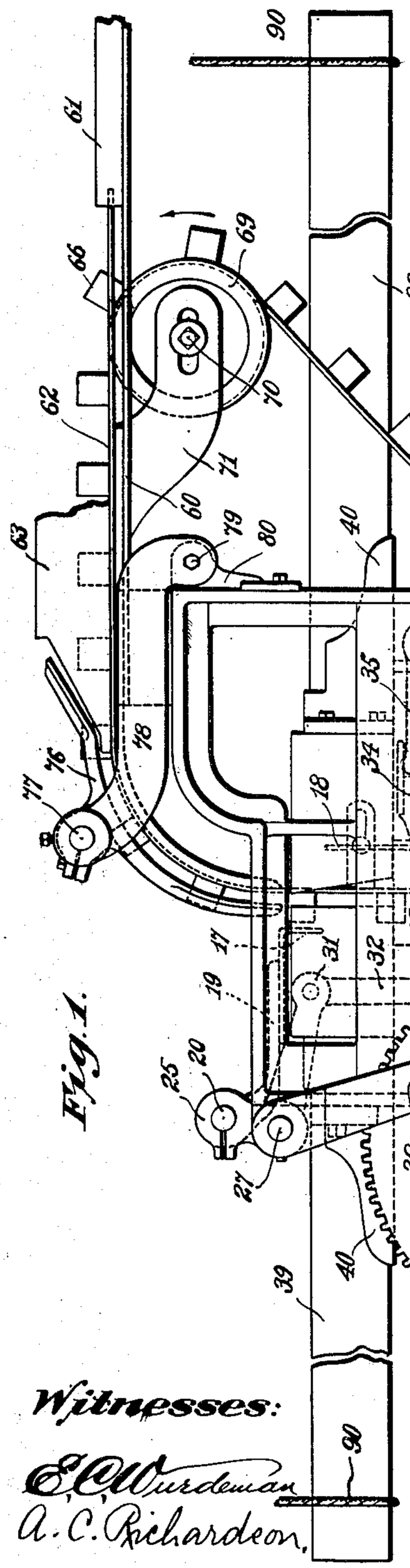

Fig. 1.

Witnesses:

E. C. Wurdeman

A. C. Richardson.

Inventor:

Roswell A. Lancey

by

Phillips Van Everen & Fish

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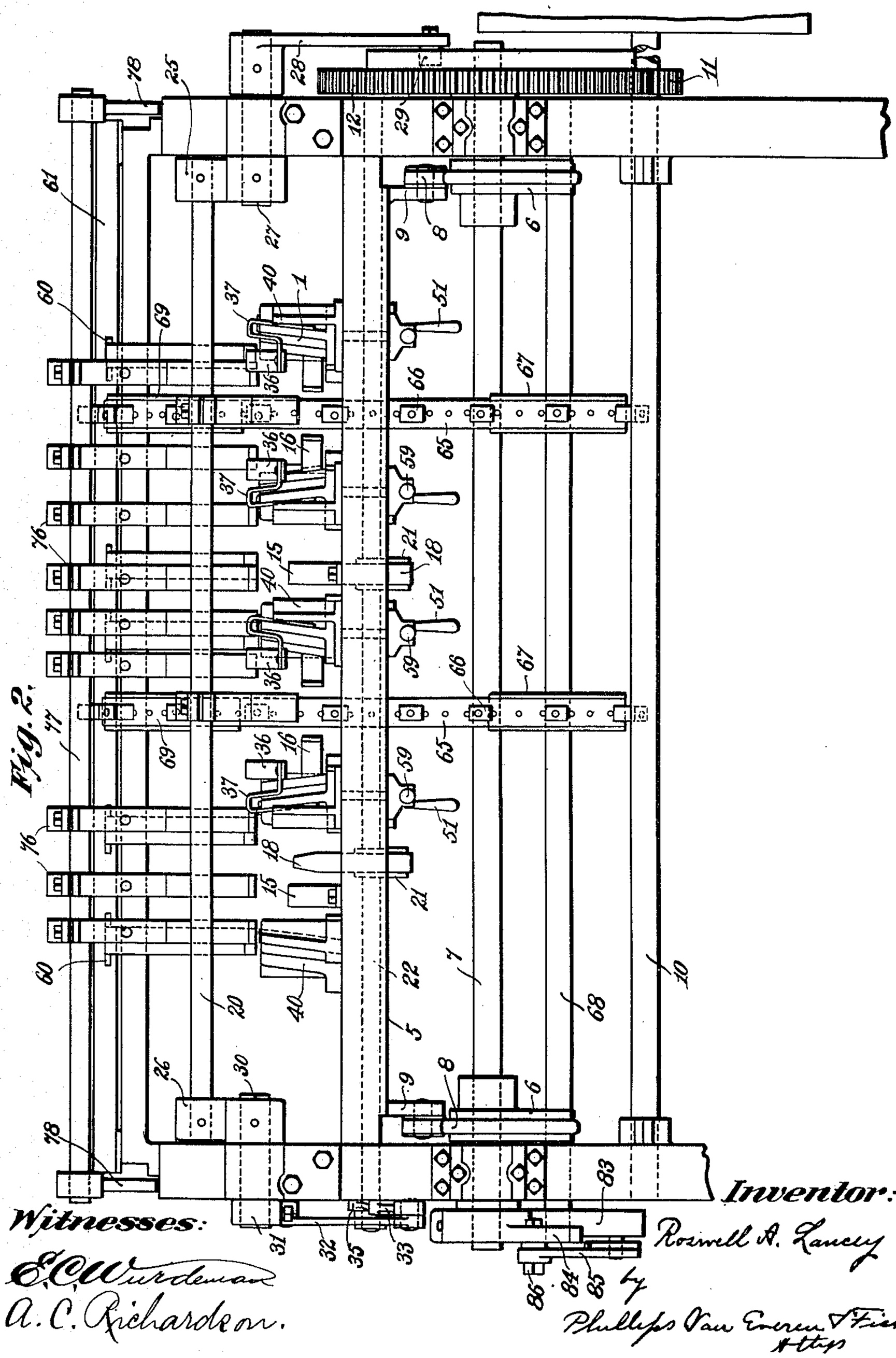

Fig. 2.

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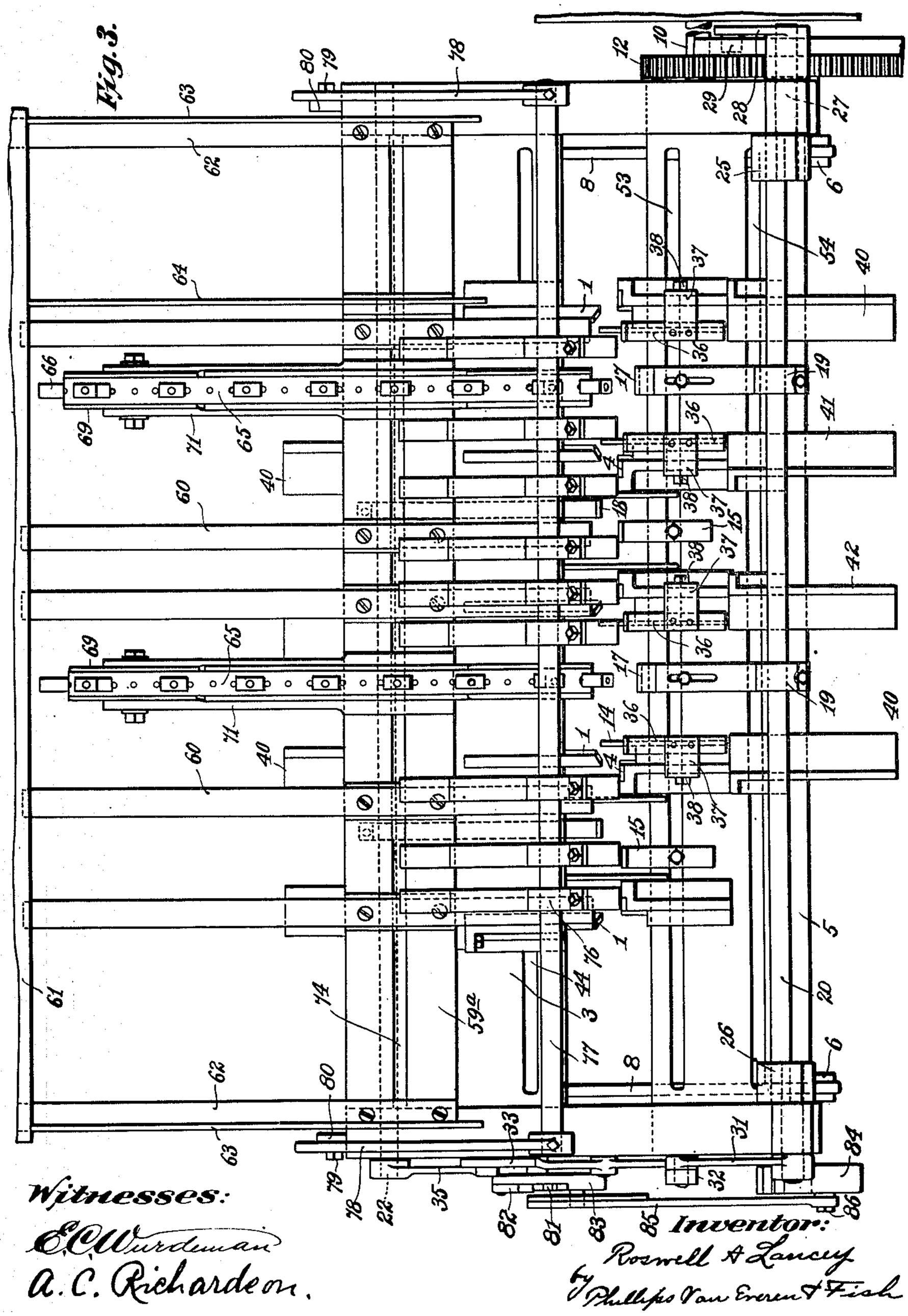
5 SHEETS—SHEET 3.

Fig. 3.



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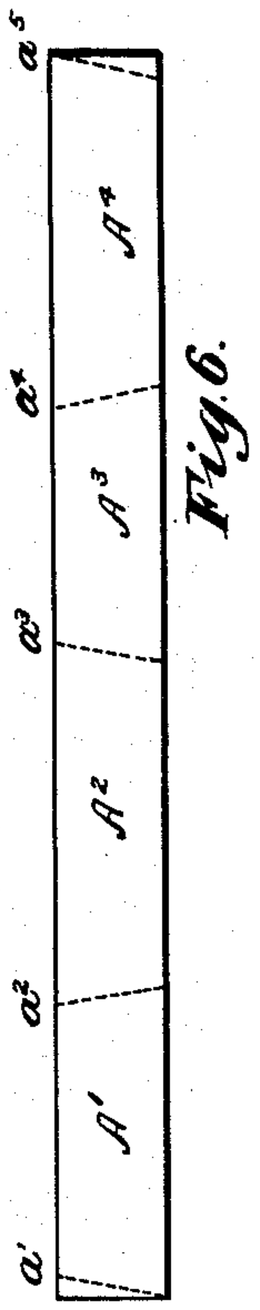

Fig. 6.

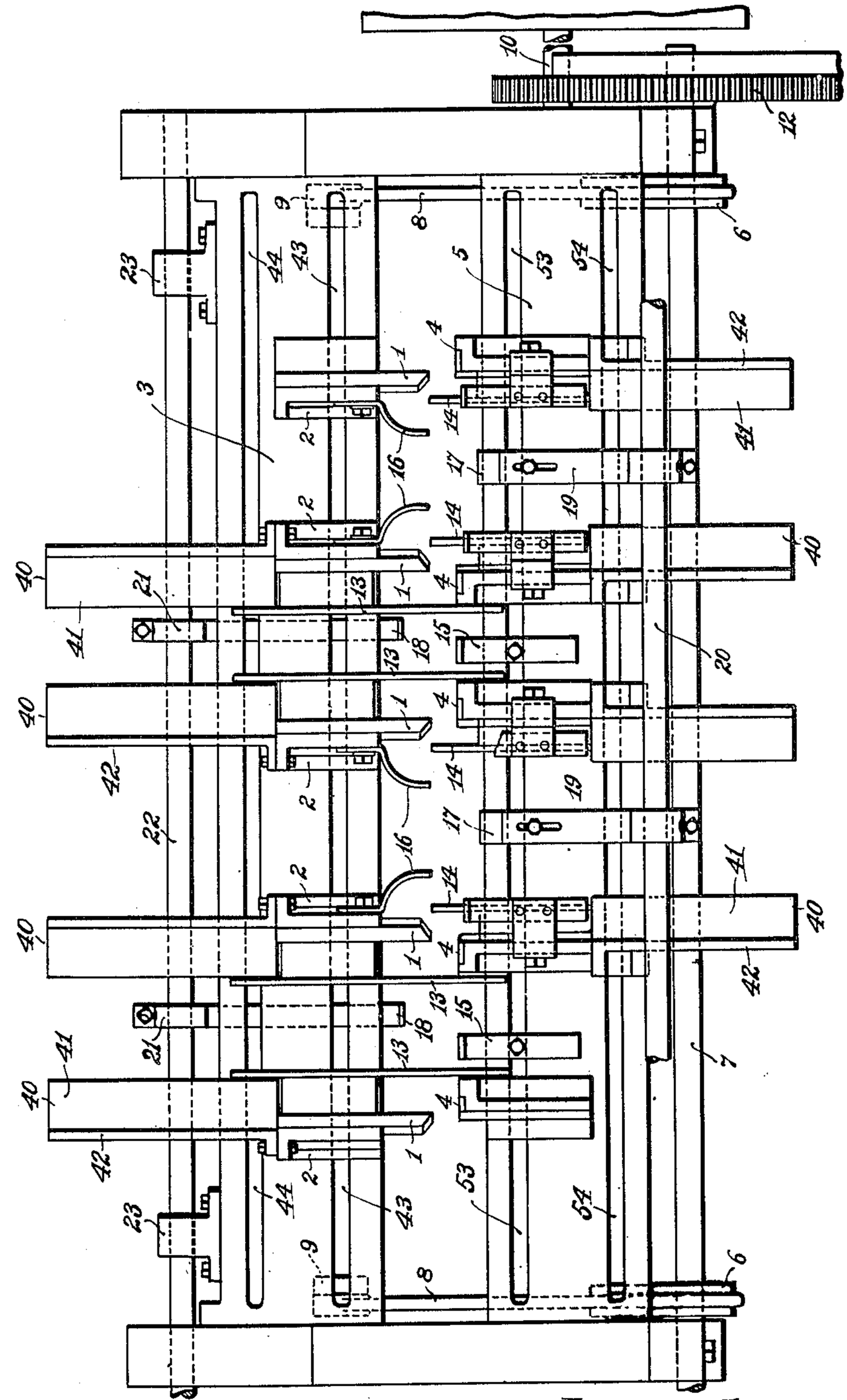

Fig. 4.

Witnesses:

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5 SHEETS—SHEET 5.

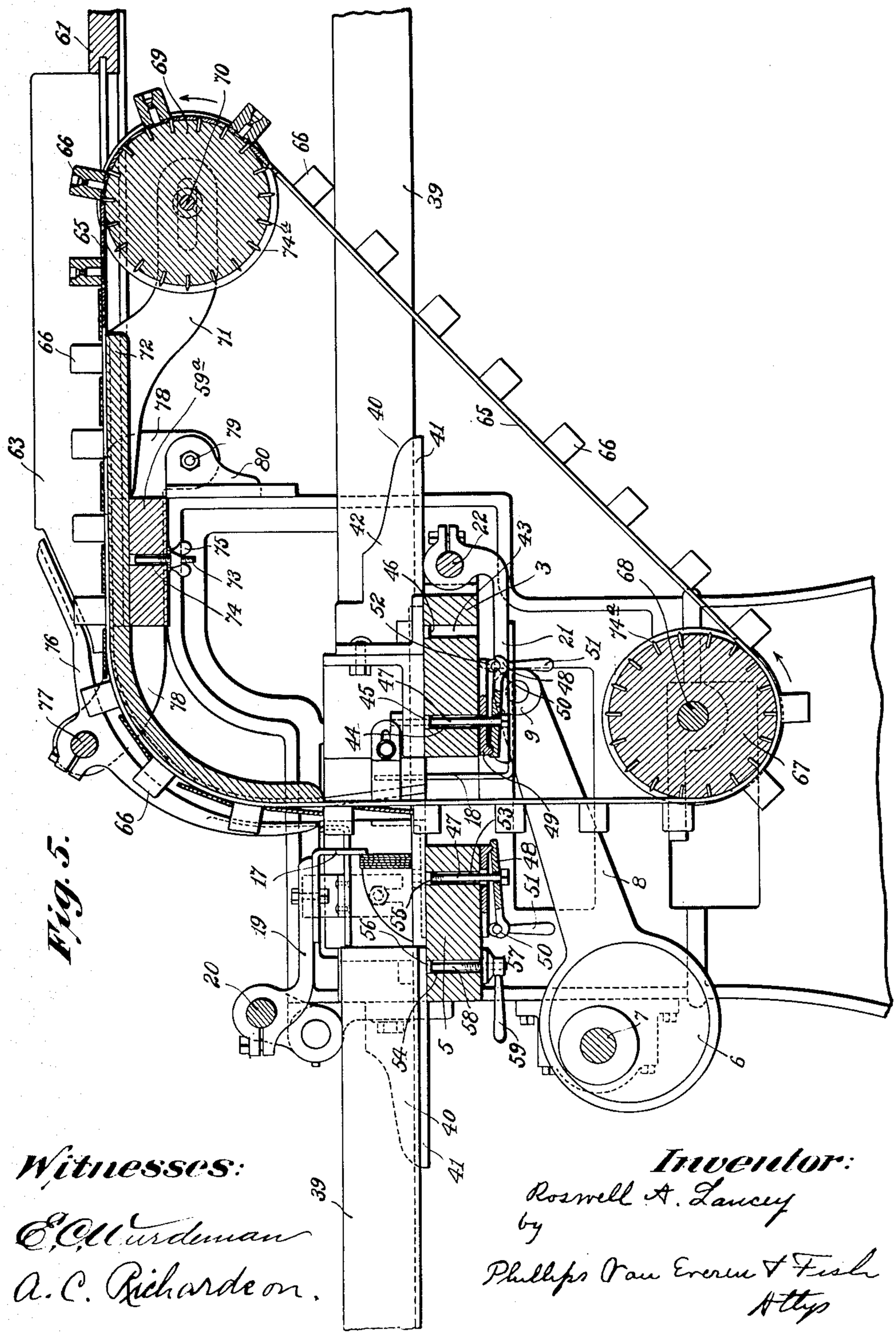

Fig. 5.

Witnesses:

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UNITED STATES PATENT OFFICE.

ROSWELL A. LANCEY, OF TOWNSEND, MASSACHUSETTS, ASSIGNOR TO J. SPAULDING & SONS CO., OF MILTON, NEW HAMPSHIRE, A CORPORATION OF NEW HAMPSHIRE.

CUTTING-MACHINE.

No. 919,363. Specification of Letters Patent. Patented April 27, 1909.

Application filed August 14, 1907. Serial No. 388,459.

To all whom it may concern:

Be it known that I, ROSWELL A. LANCEY, a citizen of the United States, residing at Townsend, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Cutting-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to cutting machines and more especially to a machine which is well adapted for dividing a strip of leather, leatherboard or like material, into sections suitable for use as blanks for boot or shoe counters and the object of the invention is to produce a machine of this character which shall be simple in construction and efficient in operation.

In accordance with one of the principal features of the invention a strip of material is divided into sections by a series of cutters and the adjacent severed sections are moved out of the cutting plane in opposite directions. For instance, if four sections are formed by the cutters, the first section is moved in one direction out of the cutting plane; the second section is moved in the opposite direction; the third section is moved in the same direction as the first section; and the fourth section is moved in the same direction as the second section. Thus adjacent sections will be moved in opposite directions and in case more than two sections are formed alternate sections will also be moved in the same direction out of the cutting plane.

Further features of the invention contemplate the automatic feeding or delivery of individual strips of stock into position to be acted upon by the cutters, although such strips may be presented manually if found desirable in practicing the broader features of the invention.

Further features of the invention contemplate the stacking of the sections or blanks as they are moved out of the cutting plane and this is preferably done by bringing each of the blanks as the blanks are cut into engagement with a stack of previously cut blanks which is supported either between two of the cutters or between two of the cooperating cutter blocks and is forced back in its supporting guideway by the engagement of a newly cut blank therewith.

In embodying these features of the invention in a machine especially adapted for the forming of blanks for boot and shoe counters, I have employed certain further features of invention which are of importance in contributing to the simplicity and efficiency of the machine, although not essentially involved in the broader features of the invention.

The various features of the invention will be readily understood from an inspection of the accompanying drawings and from the following detailed description of the specific construction shown therein.

In these drawings Figure 1 is a side elevation of a machine embodying the features of the invention in their preferred forms. Fig. 2 is a front elevation looking toward the right in Fig. 1. Fig. 3 is a plan view. Fig. 4 is a plan view with the automatic strip feeding devices removed. Fig. 5 is a sectional elevation; and Fig. 6 is a view showing the strip of material which is acted upon by the machine, the lines of severance being indicated in dotted lines.

The machine shown in the drawings is especially designed to sever previously formed strips into blanks suitable for use in the manufacture of counters for boots or shoes. As shown the machine is provided with cutting devices adapted to simultaneously divide the strip presented thereto into four sections or blanks, the ends of which are inclined equally in opposite directions. The number of sections into which the strip is severed is not important and may be varied as desired.

In order that the same machine may be utilized for cutting varying sizes of blanks, the cutting devices and the devices intimately associated therewith are so constructed and arranged that they may be readily adjusted.

While the adjustable features are not essential they are of importance in increasing the capacity and commercial value of the machine.

The blank or strip upon which the machine illustrated is designed to operate, is of rectangular form as shown in Fig. 6 and since this strip is to be divided into four sections and

the sections are to have inclined ends, the machine is provided with five cutters and five coöperating cutter blocks. The cutters 1 are secured to cutter carrying blocks 2 which are in turn secured to a crosshead or bar 3. The cutter blocks 4 with which the cutters coöperate in severing the material are secured to a second crosshead or bar 5. One or both of these crossheads may be moved to give the requisite relative movement between the cutters and cutter blocks but it is preferred to secure this relative movement by movement of the crosshead 3 which carries the cutters. The crosshead 3 is accordingly mounted to reciprocate in suitable guideways formed on the side frames of the machine, while the crosshead 5 is secured in fixed position between the side frames.

The cutter carrying crosshead is reciprocated by means of two eccentrics 6 secured to a shaft 7 and connected with opposite ends of the crosshead by links 8 each of which encircles one of the eccentrics at one end and has its other end pivoted to a lug 9 depending from the crosshead. The shaft 7 which carries the eccentrics 6 and also the cams and other devices for operating the various moving parts of the machine, extends across the machine and is continuously driven from a pulley shaft 10 through intermeshing gears 11 and 12.

The cutters and cutting blocks are arranged on the crossheads 3 and 5 so that they will coöperate in cutting the strip of material on the lines a', a^2, a^3, a^4, a^5 indicated in Fig. 6, thus dividing the strip of stock into blanks A′, A², A³, A⁴. The first and second cutters and cutter blocks at the left in Fig. 4 are so arranged that they cut on the downwardly diverging lines a', a^2 and so that the two cutter blocks pass between the cutters as the cutters advance. The third and fourth cutters and cutter blocks are similarly arranged to cut on the downwardly diverging lines a^3, a^4 and so that the cutter blocks pass between the cutters. The fifth cutter and cutter block are arranged to cut on the line a^5 and so that the cutter block passes outside the cutter. By reason of this arrangement the blanks A′ and A³ are carried between the first and second and between the third and fourth cutters respectively as the strip is severed, while blanks A² and A⁴ may be carried in the opposite direction between the second and third and between the fourth and fifth cutter blocks respectively.

In order that the blanks may be discharged by continued movement in the direction of the movement produced during the cutting operation, the surfaces of the cutters and cutter blocks in which the cutting edges lie are continued to the rear ends of the cutters and blocks to form guides for the blanks and as successive blanks are cut the previously cut blanks are forced back between said surfaces. Stacks of blanks are thus formed between the cutters and cutter blocks which may be progressively moved back into receiving trays or guideways.

The strips of stock to be cut are presented in a vertical position between the cutters and cutter blocks and the stock is supported on edge before and after the cutting by a series of supporting bars 13 and 14 mounted on the crossheads 3 and 5 respectively. The supporting bars 13 are secured to the cutter carrying blocks 2 while the supporting bars 14 are secured to the sides of the cutter blocks 5. Two of the supporting bars 13 are arranged between the first and second cutters and support the blank A′ as it is carried between said cutters, while the other two supporting bars 13 are arranged between the third and fourth cutters and support the blanks A³ as they are carried back between said cutters. The supporting bars 14 are arranged between the second and third and between the third and fourth cutter blocks and serve to support the blanks A² and A⁴ as these blanks are moved back between the cutter blocks.

During the advance of the cutter carrying head the strip of stock is carried against the ends of the cutter blocks 4 by the engagement of the cutters 1 therewith and during the continued forward movement of the cutter head the blanks are severed, the blanks A′, A³ being carried back between the first and second and third and fourth cutters respectively by the ends of the cutter blocks and by pushing fingers 15 secured to the head 5 between the cutter blocks. At the same time the blanks A², A⁴ are carried back between the second and third and third and fourth cutter blocks respectively by the action of pushing fingers 16 which are secured to the cutters 1 as indicated in Fig. 4 and have their forward ends arranged to act against the surface of the blanks between the cutters.

During the return movement of the cutter head the blanks which have been carried between the cutter blocks are retained in position by retaining fingers 17 and the blanks which have been carried between the cutters are retained in position between the cutters by retainer fingers 18. The retaining fingers 17 project downward from arms 19 which are arranged above the blanks and are secured to a bar 20. The retaining fingers 18 project upward from arms 21 which extend under the crosshead 3 and are secured to a rock shaft 22 which is mounted in brackets 23 secured to the crosshead. During the cutting operation and the forcing of the blanks between the cutters and cutter blocks respectively, the retaining fingers 17 and 18 are moved back out of the path of the blanks and the blanks severed from the strip are added to

the stack or series of blanks previously cut, the previously cut blanks being forced back as the freshly cut blanks are forced against them. As the cutter bar moves back after the cutting operation is completed, the retaining fingers 17 and 18 are moved forward in front of the blanks retaining them in position at the ends of the stacks of blanks until the next cutting operation when the fingers again move back to allow fresh blanks to be added to the stacks of blanks between the cutters and cutter blocks.

The retaining fingers are operated as described by means of a grooved cam 24 formed on the side of the gear 12 and connected to operate the bar 20 and rock shaft 22 through the following mechanism. The bar 20 by which the retaining fingers 17 are carried is mounted in two arms 25 and 26 arranged at opposite sides of the machine. The arm 25 is secured to the inner end of a short shaft 27, the outer end of which is provided with an arm 28 which carries a roll 29 engaging the cam groove 24. The arm 26 is secured to a short shaft 30 arranged in line with the shaft 27 and provided on its outer end with an arm 31. The arm 31 is connected by a link 32 with one end of a lever 33 which is pivoted on the side frame of the machine and is provided at its other end with a groove 34. The groove 34 is engaged by a pin projecting laterally from the end of an arm 35 which is secured to the end of the rock shaft 22. By reason of this groove and pin connection between the end of the lever 34 and the end of the arm 35, the operative connection is maintained between these two parts and at the same time the rock shaft 22 and arm 35 are free to move back and forth with the cutter carrying head. By these connections the cam 24 acts to raise the retaining fingers 17 and lower the retaining fingers 18 as the newly cut blanks are added to the stacks of previously cut blanks, then acts to lower the retaining fingers 17 and raise the retaining fingers 18 as the cutter head is retracted.

It will be noted that with the arrangement of cutters and cutter blocks shown, the long edge of the blanks A′ and A³ rests upon the supporting bars 13 and the surfaces of the cutters 1 which engage the ends of the blanks converge upwardly so that these surfaces confine the blanks and prevent them from rising away from the supporting bars as they are carried between the cutters. In the case of the blanks A² A⁴ however, the short edge of the blank rests upon the supporting bars 14 and the surfaces of the cutter blocks which engage the ends of the blanks diverge upwardly so that they do not act to confine the blanks against upward movement. To insure the proper movement of the blanks between the cutter blocks therefore, guard plates 36 are arranged to overlie the blanks which pass between the cutter blocks. These guard plates are provided with upwardly turned front ends and are adjustably secured to the sides of the cutter blocks by means of brackets 37 which are connected to the cutter blocks by a bolt and slot connection 38 so that the vertical position of the guard plates may be adjusted to suit the width of blanks being cut.

The stacks of blanks which are progressively formed and moved back between the cutters and cutting blocks may be delivered into suitable receptacles or upon guideways from which they may be removed but it is preferred to provide means for stacking these blanks in removable receiving trays which may be readily removed when filled with blanks and replaced by empty trays and such a construction is shown in the drawings and forms one of the features of the invention.

As indicated in Figs. 1 and 5 the blanks as they move back between the cutters and cutter blocks are guided into receiving trays 39 which are supported in line with the cutters and cutter blocks between which the blanks are moved. The receiving trays are supported and held in position by supporting brackets 40. Each supporting bracket is provided with a horizontal ledge 41 upon which the bottom of the tray rests and with a vertical side 42 for engaging the side of the tray. The supporting brackets 40 which are carried by the cutter crosshead 3 are secured to the cutter carrying heads 2 in such a position that when the receiving tray is in position between the sides of two of the supporting brackets, the inner surfaces of the sides of the tray are substantially in line with that part of the inner surfaces of the cutters corresponding to the lower edges of the blanks A′ A³. The sides of the receiving tray are therefore substantially in line with the longest edge of the blank whatever the width of the blank and whatever the adjustment of the cutters, since the longest edge of the blanks A′ and A³ always rests upon the supporting bars 13 whatever the length of blank being cut and whatever the width of the strip which is being severed. The tray supporting brackets 40 which are mounted on the head 5 and support the trays for receiving the blanks A², A⁴, which are delivered between the cutter blocks, are secured to the head 5 independently of the cutter blocks 4 and are so adjusted that the sides of the receiving trays held therein are substantially in line with that part of the surfaces of the cutter blocks which correspond to the upper edges of the blanks. Since in the case of the blanks A², A⁴ the short edge of the blank rests upon the supporting bars 14, the position of the tray supporting brackets with relation to the cutter blocks will depend

upon the width of the strip being cut as well as the length of the blank which is being severed from the strip.

In order that the machine may be adapted to form blanks of different lengths the cutter carrying blocks and cutter blocks are so mounted upon the heads 3 and 5, that the distances between successive cutters and corresponding cutter blocks may be varied as desired. The arms 19 which carry the retaining fingers 17 are also adjustably secured upon the rod 20 and the arms 21 which carry the retaining fingers 18 are adjustably secured upon the rock shaft 22 and the pushing fingers 15 are also adjustably secured upon the head 5 so that the various parts may be brought into proper relation with the cutters and cutter blocks in their various adjustments.

For the purpose of adjustment the cutter carrying head 3 is provided with slots 43, 44 and the cutter carrying heads 2 and the connected tray supporting brackets 40 are provided with lugs 45 and 46 fitting within said grooves and holding the cutter heads and tray supporting brackets in proper alinement upon the crosshead. Each of the cutter carrying heads 2 is provided with a bolt 47 (Fig. 5) which extends up through the slot 43 and is screwed into the lug 45. The head of the bolt is engaged by clamping plate 48 one end of which is fulcrumed on a bearing plate 49 and the other end of which is engaged by pins 50 carried by a cam lever 51. The cam lever 51 is provided with an eccentric cam 52 adapted to bear upon the bearing plate 49.

When the parts are in the position indicated in Fig. 5 the cam 52 and pins 50 operate to force the clamping plate 48 away from the bearing plate 49 and thus draw down on the bolt 47 to firmly clamp the cutter head in position upon the crosshead 3. By swinging the cam lever 51 either to the right or to the left, the clamping plate 48 is released so that the cutter carrying block may be moved along the crosshead into any desired position and then the cam lever may be operated to secure the cutter carrying block in its adjusted position.

The crosshead 5 is provided with slots 53 and 54 similar to the slots in the cutter carrying crosshead. The cutter blocks 4 are provided with lugs 55 fitting the slot 53 and the cutter blocks are secured in adjusted position by clamping devices similar to the clamping devices by which the cutter carrying blocks 2 are clamped upon the crosshead 3. The tray supporting brackets 40 are provided with lugs 56 which engage the slot 54 and these brackets are clamped in position upon the head 5 by means of clamping nuts 57 threaded on studs 58 which project downward from the brackets through the slot 54, the clamping nuts being provided with handles 59 by which they may be conveniently operated.

The strips of stock to be severed into sections may be placed in position to be acted upon by the cutting devices by hand if desired. The speed of the machine may be increased however by combining a suitable feeding mechanism with the cutting devices to automatically present the successive strips in position to be operated upon by the cutting devices and I prefer to employ for this purpose the feeding mechanism which I have devised and which is shown in the drawings. As here shown the machine is provided with a horizontal support arranged above the cutting devices upon which the strips are placed by the operator and from which they are transferred by an intermittently moving carrier into position between the cutters and cutter blocks. This horizontal support comprises a transverse bar 59[a] secured to the side frame of the machine and supporting the front ends of a series of strips 60, the rear ends of which are supported in a second transverse bar 61. The bar 61 is connected with and supported from the bar 59 by means of side pieces 62 having vertical flanges 63. The horizontal support is provided with an adjustable gage 64 for enabling the operator to properly position the strips upon the support. The strips are transferred from the horizontal support to a vertical position between the cutting devices by means of an endless carrier comprising two belts 65 each of which is provided with a series of equally spaced and similarly arranged blocks 66 which form feeding fingers for transferring the strips. Each belt passes over a pulley 67 secured to a shaft 68 and over a pulley 69 which is mounted upon a stud 70 secured in the rear end of a bifurcated arm 71. The stud 70 is secured in the slot in the arm 71 so that the pulley 69 may be adjusted to properly tension the belt. The arms 71 project from a plate 72 which is adjustably secured upon the bar 59 by means of a bolt 73 passing through a slot 74 in the bar and engaged by a clamping nut 75. The plates 72 are grooved to provide guideways for the belts 65 and these plates curve downwardly at their forward ends so that the belts travel from the horizontal plane of the supporting strips 60 into a vertical plane passing between the cutters and cutter blocks. The belts 65 are perforated at regular intervals and the pulleys 67 and 69 are provided with pins 74[a] to engage these perforations and secure a positive and uniform travel of the two belts.

The strips to be operated upon are placed upon the strips 60 by the operator between successive blocks 66 of the carrier and by the intermittent forward movement of the carrier, the strips are carried successively from the

horizontal support formed by the strips 60 into position between the cutters and cutter blocks and are delivered upon the supporting bars 13 and 14. In the travel of the conveyer from the horizontal to the vertical plane, the strips are retained in the recesses between the feeding fingers or blocks 66 by a series of curved guides 76. These guides are adjustably secured upon a rod 77 which is mounted in two arms 78 secured at 79 to brackets 80 on the rear of the side frames of the machine.

The carrier belts 65 are advanced the distance between successive blocks 66 for each operation of the guiding devices and this movement of the carrier belts brings the upper surfaces of the blocks 66 successively into position where they are substantially in line with the upper surfaces of the bars 13 and 14 so that the strips are successively delivered upon the supporting bars. The carrier remains at rest in this position during the cutting operation and the several blanks which lie in front of the carrier belts are carried horizontally away from said belts and out of the path of the vertically moving feeding fingers 66 by the advance movement of the cutter carrying head. After the cutter carrying head has been retracted to leave a free space between the cutters and the cutter blocks and before the cutters are returned to cutting position, the conveyer belts are again advanced to bring the succeeding strip in position to be operated upon by the cutters.

When a strip is delivered into position between the cutting devices either by hand or by feeding devices it should be accurately positioned and maintained in alinement during the action of the cutters in order that the blanks may be accurately and uniformly cut. The machine is accordingly provided with devices for positioning the strip and maintaining it in alinement during the cutting, and this forms one of the features of the invention.

The positioning and alining devices in the construction shown comprise the bars 13 and 14 which engage the lower edge of the strip and the under sides of the feeding blocks 66 which come to rest at a distance above the bars equal to the width of the strips. Each strip is therefore positioned accurately with its lower edge in the plane of the bars 13 and 14 and is held in alinement between the bars and the under sides of the blocks. The pulleys 67 are adjustably connected with the shaft or operating mechanism so that the belts 65 may be adjusted in setting the machine for any width of strip to bring the blocks into proper relation to the bars 13 and 14.

The conveyer belts 65 are thus intermittently operated by means of a ratchet wheel 81 secured to the shaft 68 and engaged by a pawl 82 carried by a pawl carrying arm 83. The pawl carrying arm is reciprocated at proper intervals by means of a crank arm 84 secured to the shaft 7 and connected with the pawl carrying arm by a link 85. The link 85 is connected with the crank arm 84 by means of a crank pin 86 adjustably secured in a radial slot 87 formed in the crank arm so that the throw of the crank may be adjusted to secure the proper feed of the conveyer belts. The link 85 is connected with the pawl carrying arm 83 by means of a slot 88 which rides over a block 89 pivoted on the pawl carrying arm. The ends of the slot 88 are so arranged that the movements imparted to the pawl carrying arm by the crank arm 84 are properly timed with relation to the other parts of the machine.

In the operation of the machine the strips of stock are rapidly positioned by the operator upon the horizontal support and are transferred by the conveyer into position between the cutting devices; are severed into sections by the cutting devices and the corresponding sections severed from the successive strips are stacked between the cutters and between the cutter blocks, the stacks thus formed being gradually moved back into the receiving trays 39. As soon as a receiving tray is filled it is removed and replaced by an empty tray which is in turn filled by the progressively increasing stack of blanks forced back between either the cutters or the cutter blocks as the case may be. The outer ends of the removable trays 39 may be supported in any suitable manner so that the trays may be conveniently removed or placed in position, as, for instance, by supporting cords 90 indicated in Fig. 1.

While I prefer to employ the specific construction and arrangement of parts shown and described, it will be understood that such construction and arrangement may be changed and modified in embodying the various features of the invention in different machines as may be found desirable or best suited to the particular conditions under which the various features of the invention are to be employed.

Without attempting to point out in detail the various constructions in which the invention may be embodied, what I claim is:—

1. A cutting machine having in combination devices for severing a strip into a plurality of sections, a carrier for carrying strips into position to be acted upon by the cutting devices, and means for moving the severed sections at right angles to the movement of the carrier.

2. A cutting machine having in combination a series of cutters and coöperating cutting blocks for severing a strip into a plurality of sections, a carrier having a series of feeding fingers for presenting successive strips in position between the cutters and cutting blocks

and means for moving the severed sections at right angles to the movement of the carrier out of the path of the fingers.

3. A cutting machine having in combination a series of cutters and coöperating cutter blocks for severing a strip into a plurality of sections, an endless carrier provided with a series of feeding fingers, means for moving said carrier from a horizontal plane into a vertical plane passing between the cutters and cutting blocks.

4. A cutting machine having in combination vertically arranged cutting devices, a horizontal support, means for transferring strips successively from the horizontal support into a vertical plane between the cutting devices, and means for stacking the severed blanks on edge.

5. A cutting machine having in combination cutting devices, a support above the cutting devices, a conveyer provided with feeding fingers forming recesses for the reception of blanks, means for guiding the conveyer from the plane of the support into a plane passing between the cutting devices and means for intermittently operating the conveyer and operating the cutting devices.

6. A cutting machine having in combination reciprocating cutting devices for severing a strip into a plurality of sections, and devices for positioning the strip and maintaining it in alinement during the action of the cutting devices, substantially as described.

7. A cutting machine having in combination a series of reciprocating cutters for severing a strip into sections, and devices for maintaining a strip in alinement during the action of the cutters, substantially as described.

8. A cutting machine having in combination a series of reciprocating cutters for severing a strip into sections, and devices between which the strip is confined during the action of the cutters, substantially as described.

9. A cutting machine, having, in combination, a series of reciprocating cutters for severing a strip into sections, and devices arranged to engage the edges of the strip and maintain it in alinement during the cutting.

10. A cutting machine, having, in combination, two series of cutters, a support upon which the edge of a strip rests when between the two series of cutters, a retainer arranged to overlie the upper edge of the strip and hold it in proper relation to the cutter, and mechanism for relatively reciprocating the two series of cutters.

In testimony whereof I affix my signature, in presence of two witnesses.

ROSWELL A. LANCEY.

Witnesses:

IVA L. FISH,

ANNIE C. RICHARDSON.