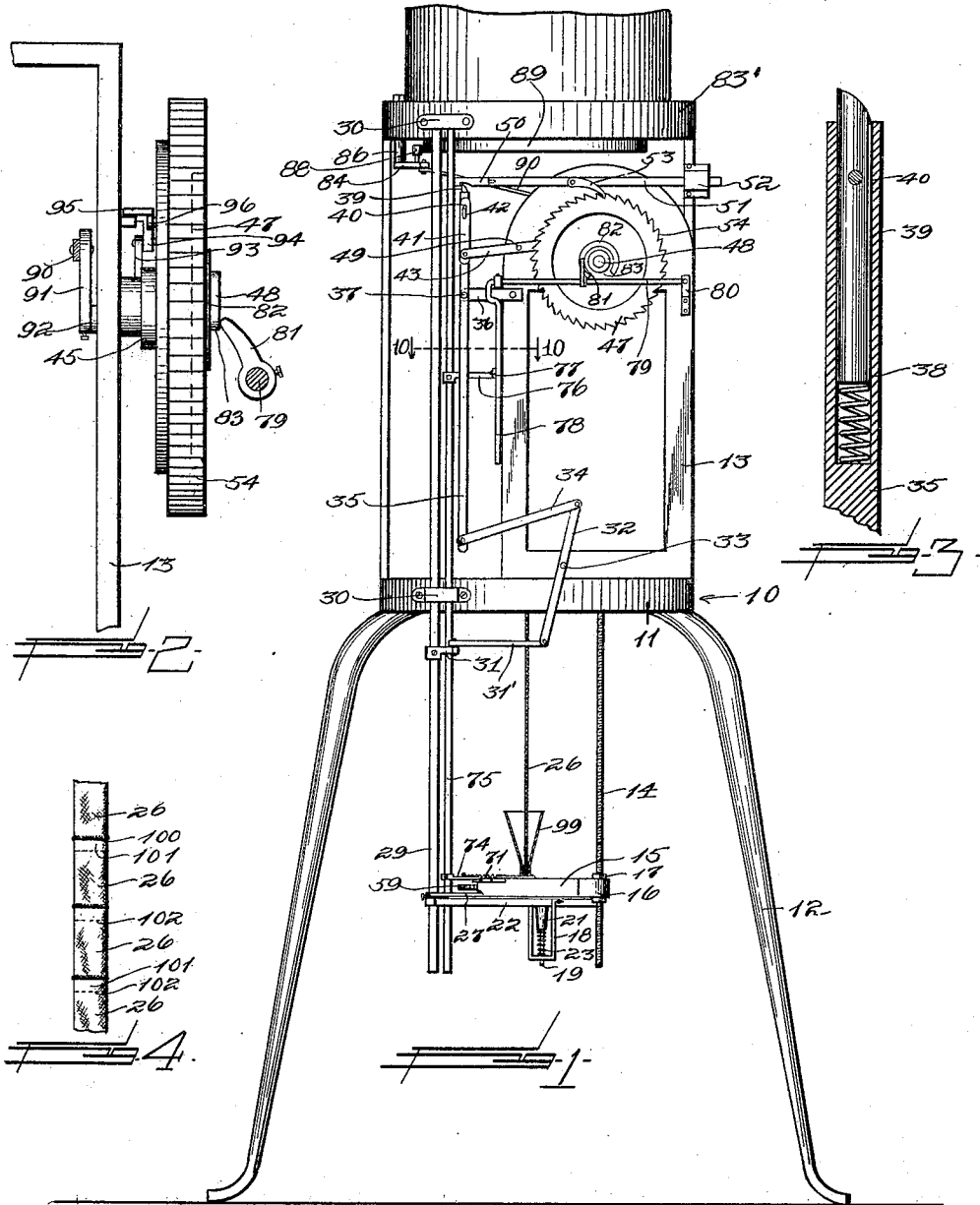


J. H. ADAMEE.
CUTTING MECHANISM FOR KNITTING MACHINES.
APPLICATION FILED JUNE 5, 1913.

1,103,922.

Patented July 14, 1914.

4 SHEETS-SHEET 1.



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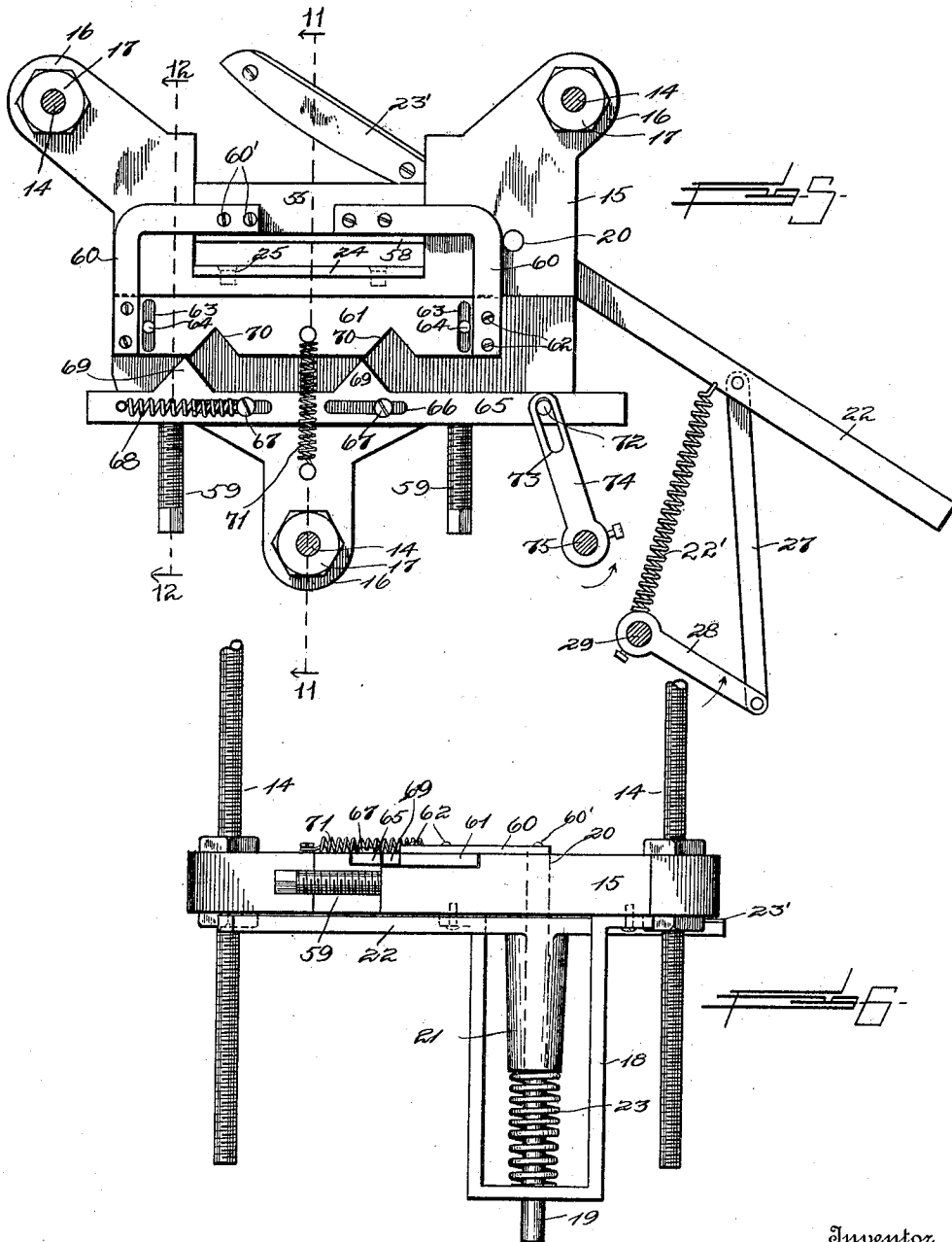
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4 SHEETS-SHEET 2.



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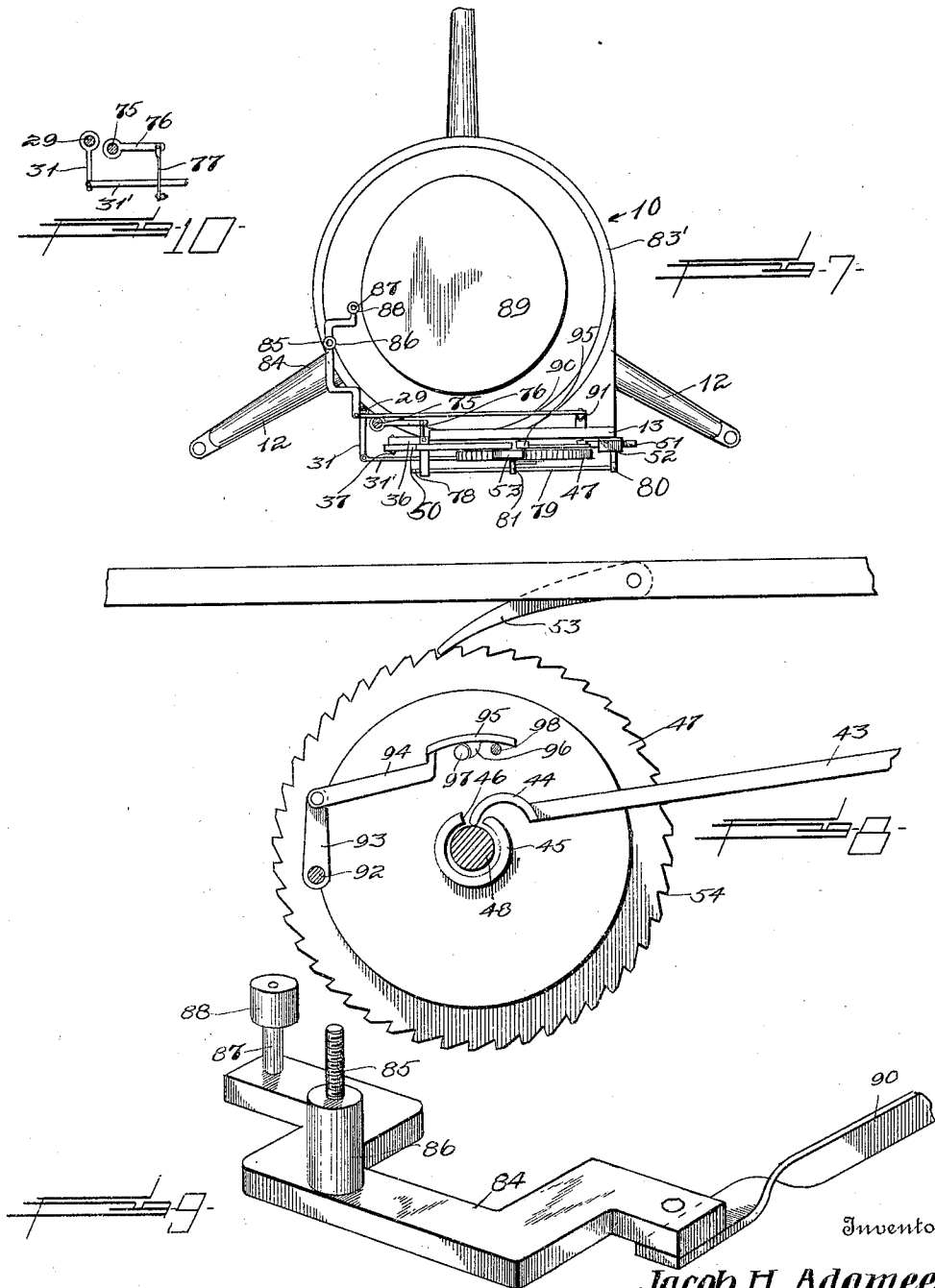
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4 SHEETS—SHEET 3.



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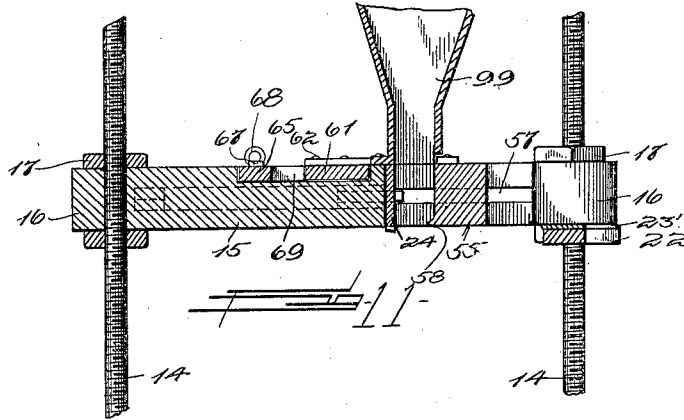
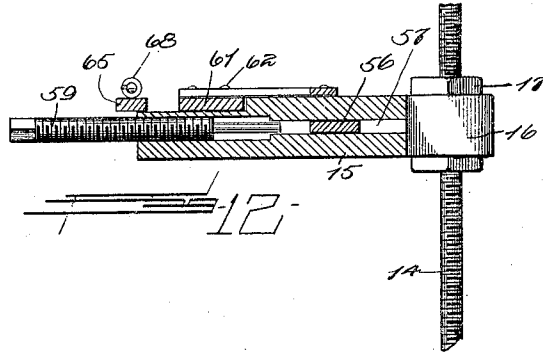
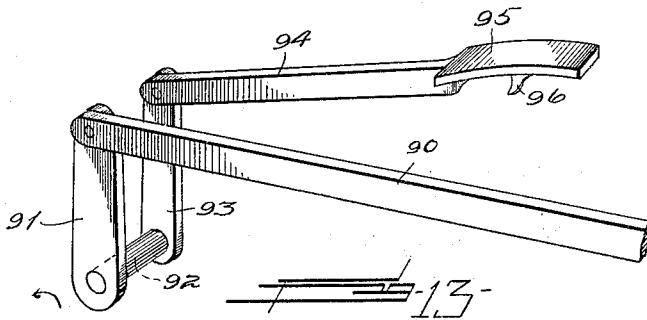
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4 SHEETS-SHEET 4.



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UNITED STATES PATENT OFFICE.

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CUTTING MECHANISM FOR KNITTING-MACHINES.

1,103,922.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JACOB H. ADAMEE, a citizen of the United States, residing at Durham, in the county of Durham and State of North Carolina, have invented certain new and useful Improvements in Cutting Mechanism for Knitting-Machines, of which the following is a specification.

My invention relates broadly to improved means for cutting a continuous strip of moving fabric or the like into sections of desired lengths, and has particular reference to means of this character which are well adapted to be used in connection with a stocking knitting machine, or more or less analogous machines, for cutting the stocking tops apart as the same are being discharged from the machine in a single continuous strip, but of course not necessarily restricted to such use.

An important object of the invention is to provide means of the above mentioned character, which will cut the stocking tops at the right point in an expeditious and continuous manner.

A further object of my invention is to provide novel clamping means which are set into action just before the cutting means, to engage the stocking top, thus momentarily holding the same against movement while it is being cut.

A further object of my invention is to provide means of the above mentioned character, which are wholly automatic in operation.

A further object of this invention is to provide means of the above mentioned character, which are simple in construction, strong and durable.

Other objects and advantages of this invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same, Figure 1 is a side view of my entire apparatus, showing the same in place upon a stocking knitting machine, Fig. 2 is an enlarged end view of a pattern wheel included in the stocking knitting machine, parts of my apparatus being shown associated therewith for the sake of illustration, Fig. 3 is an enlarged sectional view through the upper end of an operating lever, showing the pawl therein,

Fig. 4 is a side view of a plurality of attached stocking tops, Fig. 5 is a plan view of the cutting and clamping means removed from the stocking knitting machine, Fig. 6 is a side view of the same, Fig. 7 is a plan view of the entire apparatus, Fig. 8 is an inner end view of the pattern wheel showing parts of my apparatus associated therewith, Fig. 9 is a perspective view of a lever included in the control lever resetting means, Fig. 10 is a detail horizontal section taken on line 10—10 of Fig. 1, Fig. 11 is a transverse sectional view taken on line 11—11 of Fig. 5, Fig. 12 is a similar view taken on line 12—12 of Fig. 5, and, Fig. 13 is a perspective view of a portion of the control lever resetting means.

In the drawings, wherein for the sake of illustration, is shown a preferred embodiment of my invention, the numeral 10 designates a H. Brenton stocking knitting machine, as a whole, upon which I have applied my apparatus, it being understood that such apparatus is not solely restricted for use in connection with this type of machine. The stocking knitting machine comprises a base 11, supported by depending legs 12. Mounted upon the base 11 is an upstanding frame 13. Only those parts of the stocking knitting machine which serve to actuate parts of my apparatus, or are necessary to clearly illustrate the same, will be shown, as no claim is made to the stocking knitting machine *per se*.

Attached to the base 11 and depending therefrom are supporting rods 14, preferably three in number, as more clearly shown in Fig. 5. Mounted upon the lower portions of the depending rod 14 is a plate or block 15, the same being preferably provided with apertured ears 16, through which the rods 14 pass, such rods being screw-threaded and provided with clamping nuts 17 disposed above and below the ears 16, as shown. It is thus seen that means are provided for supporting the plate or block 15 in adjustment at a desired vertical position. Rigidly connected with the lower surface of the plate or block 15 is a depending U-shaped bracket 18 having its lower end apertured for receiving a spindle 19, the upper end of which operates within an opening 20 formed through the block 15, as shown. Preferably rigidly mounted upon the spindle 19 is a sleeve 21, carrying a cutter-lever 22. The

sleeve 21 and lever 22 are forced upwardly by a suitable stiff compressible coil spring 23, as shown. Detachably and rigidly connected with the inner end of the cutter-lever 22 is a slightly curved blade 23', adapted to co-act with the lower sharp edge of a relatively stationary cutter-blade 24, which is detachably connected with the block 15 by means of screws 25 or the like, the lever 22 being of course disposed below the block 15. In the operation of the machine, the stocking tops 26 are discharged downwardly in a single continuous strip or section, and pass between the cutter-blades 23' and 24 whereby the same are properly cut apart.

Pivotally connected with the outer portion of the cutter-lever 22 is a link 27, which is pivotally connected with a crank 28, which in turn is rigidly mounted upon an upstanding rock-shaft 29. This rock-shaft is journaled through fixed bearings 30, as shown. Connected with lever 22 is a retractile coil spring 22' having one end secured to the rock-shaft 29. The function of this spring is to reset the cutter-lever 22. As shown in Fig. 1, the rock-shaft 29 has a laterally extending crank 31 rigidly mounted thereon below and adjacent the base 11, to which is pivoted a link 31', having pivotal connection with an upstanding link or lever 32, which is pivoted between its ends to the frame 13, as shown at 33. Pivotally connected with the upper end of the lever 32 is a link 34, the opposite end of which is pivotally connected with the lower end of a vertically swinging operating lever 35. This operating lever is pivoted between its ends and near the upper end thereof with a fixed support or element 36, as shown at 37. The upper end of the operating lever 35, as clearly shown in Fig. 3, is provided with a longitudinally extending socket 38, for receiving a reciprocatory pawl 39, which is provided with a transverse pin 40. The upper beveled end of the pawl 39 is normally held within or flush with the upper end of the lever 35, the pin 40 operating through a longitudinal slot formed in the wall of the socket 38.

The numeral 41 designates a depending link provided with a slot 42, for receiving the pin 40. Pivotally connected with the lower end of the link 41 is a control lever 43, (see more particularly Figs. 1 and 8,) which is provided at its inner end with a curved downwardly extending finger 44, to engage with the periphery of an annular flange 45, and to drop within a recess 46 formed therein. This annular flange 45 is rigidly mounted upon the inner end or face of the pattern wheel 47, included in the stocking knitting machine, the same being mounted upon a shaft 48. The control lever 43 is pivoted between its ends with support 13, as shown at 49. It is thus seen that as long as the finger 44 engages or rides upon the

periphery of the annular flange 45, the pawl 39 will be drawn inwardly with its upper end below or flushed with the upper end of the lever 35, whereby the same cannot be engaged by a reciprocatory dog 50, having one end thereof hooked and the opposite end rigidly connected with a reciprocatory rod 51, operating through a guide bracket 52. It is thus seen that the lever 35 is in effect longitudinally extensible and there is means to periodically longitudinally extend the lever. In other words the reciprocatory rod or lever 51, is normally independently movable with relation to the lever 35, there being means adapted to be periodically operated to effect a temporary operative connection between the elements 35 and 51. Pivotally connected with the reciprocatory rod 51 is a pawl 53 extending downwardly to engage ratchet teeth 54, formed upon the pattern wheel 47, to impart a step by step movement to the same. The reciprocatory rod 51 and pawl 53 are included in the stocking knitting machine and are operated by elements included therein, it being sufficient to state here that the movement of the reciprocatory rod 51 is imparted to the pattern wheel 47, which is given a step by step movement, such step by step movement not being continuous but intermittent. It is obvious that upon the entrance of the free end of the finger 44 into the recess 46, the pawl 39 will be elevated, whereby the same may be engaged by the hooked end of the dog 50. This will swing the upper end of the operating lever 35 to the right and through the medium of the connecting means disposed therebetween, swing the cutter-lever 22 to swing the cutter-blade 23' into slidable engagement with the stationary cutter-blade 24 and cut the stocking top disposed therebetween.

In order that the stocking top may be cut at the proper point, that is below and adjacent the welt, it is necessary to provide clamping means to momentarily or temporarily hold the stocking top or tops against longitudinal movement, during the cutting action. The clamping means preferably comprise a reciprocatory transverse element or block 55, which is mounted to reciprocate toward and away from the stationary cutter-blade 24. The reciprocatory clamping element or block 55 is provided at its ends with tongues 56, which are slidably mounted within grooves 57, formed in the block 15, as shown. The clamping block or element 15 is provided upon its inner lower longitudinal edge with a laterally extending flange 58, which is adapted to engage the stationary cutter-blade 24 adjacent and a little above the cutting edge thereof, to clamp the stocking top thereto.

The numeral 59 designates adjustable bolts or stops, operating within screw-

threaded openings formed through the block 15, which lead into the slots 56, such bolts having reduced free ends extending into the slots 56 and adapted to engage the tongues 57 of the clamping element 55, to positively limit the inward movement thereof. This adjustment is advantageous when the apparatus is being used with fabrics of different thicknesses.

Slidably mounted upon the upper surface of the block 15 are curved arms 60, which are rigidly connected with the clamping element or block 55, as shown at 60'. The opposite ends of these curved arms 60 are rigidly connected with a transversely movable locking plate 61, as shown at 62. The locking plate 61 is provided with transverse slots 63, receiving guide pins 64 which are fixed to the block 15. Longitudinally movably mounted upon the upper surface of the block 15 is a co-acting locking plate or strip 65, provided with longitudinal slots 66, receiving guide pins or screws 67, which are fixed to the block 15. Connected with one end of the longitudinally movable locking plate 65 is a retractile coil spring 68, the opposite end of which is attached to one of the guide pins 67, as shown. It is thus seen that when the locking plate 65 is released, the spring 68 will automatically shift the same to the right, whereby V-shaped teeth 69 carried thereby will be moved into V-shaped recesses or pockets 70 formed in the locking plate 61. When this takes place the locking plate 61 is moved transversely by a retractile coil spring 71, attached thereto, the opposite ends of which is attached to the block 15, as shown. It is thus seen that as soon as the locking plate 65 is shifted to the right, the clamping element or block 55 will be automatically swung inwardly, whereby the flange 58 thereof will clamp the stocking top or the like against the lower portion of the blade 24. The plate 65 is provided near one end with a pin 72, which extends into a longitudinal slot 73 formed through a crank 74. The crank 74 is rigidly mounted upon a second upstanding rock-shaft 75, as shown. Rigidly mounted upon the upper portion of the rock-shaft 75 is a crank 76, (see Fig. 10), having pivotal connection with a pitman or link 77, which is pivotally connected with a depending crank 78, carried by a horizontal rock-shaft 79, journaled through fixed bearings 80. Rigidly mounted upon the rock-shaft 79 is a control finger 81, engaging the end wall (not the periphery), of an annular flange 82 formed upon the outer end of the pattern wheel 47. The annular flange 82 is provided with a recess 83, for receiving the end of the control finger 81, whereby the rock-shaft 79 and associated elements are free to be moved, so that the spring 68 will automatically swing the locking plate 65, to the right sub-

sequently to which the spring 71 will swing the locking plate 61 and associated elements transversely. Upon further movement of the pattern wheel 47, the control finger 81 will engage the end of the annular flange 82, whereby the same will be swung outwardly to turn the rock-shaft 79. This movement of the rock-shaft through the medium of the connecting means therebetween, will shift the locking plate 65 to the left, whereby the teeth 69 thereof will force the co-acting locking plate 61 away from the locking plate 65, said teeth 69 subsequently engaging the longitudinal edge wall of the plate 61, holding the clamping element 55 in its set position.

Rigidly connected with the upper end of the frame 13 is a head 83', included in the stocking knitting machine. Disposed below this head 83', (see more particularly Figs. 1, 7 and 9), is an approximately U-shaped lever 84, pivoted thereto by means of a bolt 85, carrying a spacing sleeve 86. At one end of the approximately U-shaped lever 84 carries an upstanding pin 87, upon which is rotatably mounted a roller 88, engaged by a cam 89 included in the stocking knitting machine and which is continuously rotated. Pivotally connected with the opposite end of the lever 84 is a link 90, pivotally connected with an upstanding crank 91, which is rigidly mounted upon a rock-shaft 92 journaled within a stationary bearing arranged adjacent and upon the inner side of the pattern wheel 47. Rigidly connected with the opposite end of the rock-shaft 92 is an upstanding crank 93, the upper end of which is pivoted to a dog 94, provided with a head 95, carrying a depending tooth 96, adapted to engage with a pin 97, fixed upon the inner end of the pattern wheel and disposed in alinement with the recess 46. The function of the dog 94 and associated elements is to move the pattern wheel 47 an additional step at the right time, whereby the finger 44 will be moved out of the recess 46, before the dog 50 can engage the pawl 39, to swing the operating lever 35 a second time during the same operation.

The numeral 98 designates a fixed pin, attached to the frame 13, and disposed below the free end of the head 95, to prevent the same from swinging downwardly but not effecting its longitudinal movement.

I preferably provide a guide 99, disposed above and adjacent the stationary cutter-blade 24, the same having an upwardly flaring body portion or mouth to receive the stocking tops 26 and a reduced lower portion to guide the stocking tops between the blades 24 and 23', such reduced portion serving to hold the stocking top flat, and preventing the same from bending or becoming tangled more or less.

As more clearly shown in Fig. 4, the nu-

meral 26 designates the stocking tops, which are knitted in a continuous strip or section, each stocking top being provided adjacent its lower end with a rib or welt 100, formed by increasing the thickness of the material. The stocking tops are cut below and adjacent the rib or welt 100, that is at about the point 101, which is above and spaced from eyes 102 formed upon the upper end of the adjacent lower stocking top.

The operation of the apparatus is as follows:—As the stocking tops 26 are being made or knitted, the same discharge downwardly from the machine and pass through the guide chute 99 between the cutter-blades 24 and 23'. During the operation of the machine, the rod 51 is reciprocated, whereby the pawl 53 imparts a step by step movement to the pattern wheel 47. By the time the lowermost stocking top 26 moves downwardly sufficiently so that the rib or welt 100 of the adjacent upper stocking top is disposed above and adjacent the flange 58 of the clamping element or block 55, the pattern wheel has been turned sufficiently whereby the control finger 81 enters the recess or opening 83 of the annular flange 82. When this occurs the spring 68 is free to operate the locking plate 65 and elements connected therewith, such spring moving the locking plate 65 longitudinally to the right whereby the teeth 69 enter the recesses 70. The spring 71 will then move the clamping element or block 55 transversely toward the stationary cutter-blade 24, clamping the stocking top to the cutter-blade below and adjacent the rib or welt 100. The longitudinal movement of the stocking tops is thus stopped for a few moments. Soon after the action of the clamping means, the opening 46 which is set a little behind the opening or recess 83 with respect to the direction of rotation of the pattern wheel 47, is brought adjacent the finger 44, whereby such finger will move therein. The lever 43 will then have its outer end swung upwardly, to allow the pawl 39 to move upwardly beyond the operating lever 35. This movement of the lever 43 to release the pawl 39 takes place when the rod 51 is moved longitudinally to the right, whereby the rod must be moved to the left before the dog 50 can engage the pawl 39. Upon the second movement of the rod 51 to the right the dog 50 will, by engaging the pawl 39, swing the operating lever 35, whereby the same will swing lever 32, which will turn rock-shaft 29. Rock-shaft 29 swings crank 28 forwardly in the direction of the arrow, which in turn will swing the lever 22, whereby the cutter-blade 23' will be swung inwardly to cooperate with the stationary cutter-blade 24 to cut the stocking top, the clamping means remaining set during the cutting operation and for a little while thereafter. Upon the return of the

rod 51 to the left after the second movement to the right, it is desirable to again move the pawl 39 to its concealed position, so that the same will not be engaged by the rod 51 upon its third movement to the right, to prevent the cutting mechanism being actuated twice during the same operation. To accomplish this I have provided the approximately U-shaped lever 84 and associated elements. When the rod 51 has been moved to the right for the second time and upon its beginning of the next movement to the left, before the dog 50 is moved into proximity to the pawl 39, the operating portion of the cam 89 engages the roller 88, to swing the lever 84, whereby the link 90 will turn the rock-shaft 92 in the direction of the arrow and the crank 93 will move the dog 94 longitudinally to impart an additional step to the pattern wheel, whereby the finger 44 of the control lever 43 will be brought into engagement with the end wall of the recess 46, and the outer end of the lever 43 swung downwardly to move the pawl 39 to its concealed position before the dog 50 can engage the same. While I prefer to provide this means for removing the finger 44 out of the opening 46, I do not desire to solely restrict the invention to the same, as other means may be employed, but it has been found that fairly satisfactory results are obtainable without the use of such means, in such case the cutting mechanism would simply be actuated twice during the same operation, which might result in undue wear upon the cutting blades. Upon the further movement of the pattern wheel 47, the finger 81 engages the end wall of the annular flange 82 and is swung outwardly. This movement of the finger 81 causes the rock-shaft 79 to be turned whereby the crank 78 is swung inwardly. This causes the crank 76 to be swung inwardly whereby the rock-shaft 75 is turned in the direction of the arrow, as more clearly shown in Fig. 5. The movement of the rock-shaft 75 swings the crank 74 to the left, causing the locking plate 65 to be moved longitudinally in the same direction against the opposition of the spring 68. The V-shaped teeth 69 now effect the transverse movement of the co-acting locking plate 61, whereby the clamping means is reset.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having described my invention, I claim:—

1. Apparatus of the character described, comprising a support, a stationary cutter-blade attached thereto, a clamping element arranged upon one side of the cutter-blade

and adapted to reciprocate transversely toward and away from the cutter-blade, automatic means adapted upon the release of the clamping element to move the same toward the stationary cutter-blade, means to normally retain the clamping element set, means to move said means whereby the clamping element is released, and a movable cutter-blade arranged to cooperate with the stationary cutter-blade.

2. Apparatus of the character described, comprising a relatively stationary cutter-blade, a clamping element extending longitudinally of the cutter-blade upon one side thereof and movable transversely toward and away from the same, locking means adapted to normally hold the clamping element away from the stationary cutter-blade, means to automatically move the clamping element toward the stationary cutter-blade upon the release of the clamping element, and a movable cutter-blade arranged to cooperate with the stationary cutter-blade.

3. Apparatus of the character described, comprising a substantially horizontal support having an opening formed therethrough to receive stocking tops passing downwardly, a substantially horizontal stationary cutter blade mounted within the opening of the support and attached to the same, a reciprocatory clamping element substantially horizontally arranged within the opening and in substantially the same horizontal plane with the stationary cutter-blade for movement toward and away from the cutter-blade, and a movable cutter-blade pivoted to the support below and adjacent the clamping element to cooperate with the stationary cutter-blade.

4. Apparatus of the character described, comprising a substantially horizontal stationary cutter-blade, a substantially horizontal reciprocatory clamping element mounted upon one side of the stationary cutter-blade in substantially the same horizontal plane therewith and provided upon its side adjacent the cutter-blade with a laterally extending bead engaging flange, a pivoted cutter-blade arranged below and near the reciprocatory clamping element and adapted for movement toward and away from the stationary cutter-blade, and automatic means to move the pivoted cutter-blade and clamping element.

5. In apparatus of the character described, the combination with a support provided with an opening, of a stationary cutter-blade mounted within the opening and attached to the support, a reciprocatory clamping element mounted within the opening and movable toward and away from the stationary cutter-blade, a transversely reciprocatory locking plate connected with the clamping element and provided with tapered recesses, a longitudinally reciprocatory co-

acting locking plate provided with laterally extending tapered teeth to enter the tapered recesses of the first named locking plate, a spring attached to the first named locking plate to move the same in one direction when released, a spring attached to the longitudinally reciprocatory locking plate to move the same in one direction when released, and a pivoted cutter-blade mounted to cooperate with the stationary cutter-blade.

6. In apparatus of the character described, the combination with a support, of a stationary cutter-blade attached thereto, a reciprocatory clamping element movable toward and away from the stationary cutter-blade, automatic means adapted when released to move the reciprocatory clamping element toward the cutter-blade, adjustable stops to positively limit the movement of the reciprocatory clamping element toward the stationary cutter-blade, and a movable cutter-blade mounted to cooperate with the stationary cutter-blade.

7. In apparatus of the character described, the combination with a support, of a reciprocatory clamping element mounted thereon, adjustable stops to limit the movement of the reciprocatory clamping element in one direction, locking means adapted to normally hold the reciprocatory clamping element against movement, means to automatically move the reciprocatory clamping element in one direction when released, and cutting means disposed near the reciprocatory clamping element.

8. In apparatus of the character described, the combination with a support, of a movable longitudinally extensible lever connected therewith, an operating element arranged near one end of the lever to engage with it when the same is extended, means to periodically longitudinally extend the lever, and cutting mechanism connected with and operated by the lever.

9. In apparatus of the character described, the combination with a support, of a pivoted longitudinally extensible lever connected therewith, a reciprocatory operating element mounted near one end of the lever to engage with it when it is extended, means to periodically longitudinally extend the lever, and cutting mechanism connected with and operated by the pivoted lever.

10. In apparatus of the character described, the combination with a pivoted operated lever, of a reciprocatory spring pressed dog mounted thereon, means to normally retain the dog in its inner position, a reciprocatory element to engage the dog when it occupies the outer position to swing the pivoted lever, cutting mechanism, and operating connecting means between the cutting mechanism and the pivoted lever.

11. In apparatus of the character described, the combination with a relatively

stationary clamping element, of a movable co-acting clamping element adapted to move transversely thereof, a spring to move the movable clamping element toward the relatively stationary clamping element, a plate
5 connected with the movable clamping element and provided with laterally extending openings, a longitudinally movable plate provided with lateral extensions adapted for movement into and out of the lateral openings,
10 and means to move the longitudinal plate in one direction.

12. The combination with a support, of a stationary cutter-blade attached thereto, a
15 clamping element arranged upon one side of the stationary cutter-blade, extending longitudinally thereof, and movable transversely toward and away from the stationary cutter-blade, a transversely movable plate
20 mounted upon the support and provided with an inclined face and having operative connection with the clamping element, a longitudinally movable element mounted upon the support for movement at approximately a right angle to the direction of movement of the transversely movable plate and provided with a lateral projection having an inclined face to engage with the first named inclined face
25 for shifting the transversely movable plate in one direction, a spring connected with the transversely movable plate to move the same when it is released, means to move the longitudinally movable element, and a movable
30 cutter-blade arranged to cooperate with the stationary cutter-blade.

13. Apparatus of the character described, comprising a substantially horizontal support provided with a main opening having
40 transverse walls provided with grooves, a

transversely movable clamping element extending longitudinally within the main opening and provided at its ends with reduced tongues to enter the grooves, a stationary blade attached to the support inwardly of the clamping element, means to
45 move the clamping element toward the stationary blade, and a movable cutter-blade arranged to cooperate with the stationary cutter-blade.

14. In apparatus of the character described, the combination with a support, of a movable lever connected therewith, an operating element arranged near the lever and normally independently movable with relation thereto, means to effect a temporary operative connection between the movable lever and operating element, means to periodically actuate such connecting means, and cutting mechanism connected with and operated by the movable lever.
55

15. In apparatus of the character described, the combination with a support, of a pivoted lever connected therewith, a reciprocatory operating element arranged near one end of the lever and normally independently movable with relation thereto, means to temporarily effect an operative connection between the pivoted lever and reciprocatory operating element, means to periodically actuate the connecting means, and cutting mechanism connected with and operated by the pivoted lever.
60 65 70 75

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

JACOB H. ADAMEE.

Witnesses:

W. G. BRAMHAM,
R. C. COX.