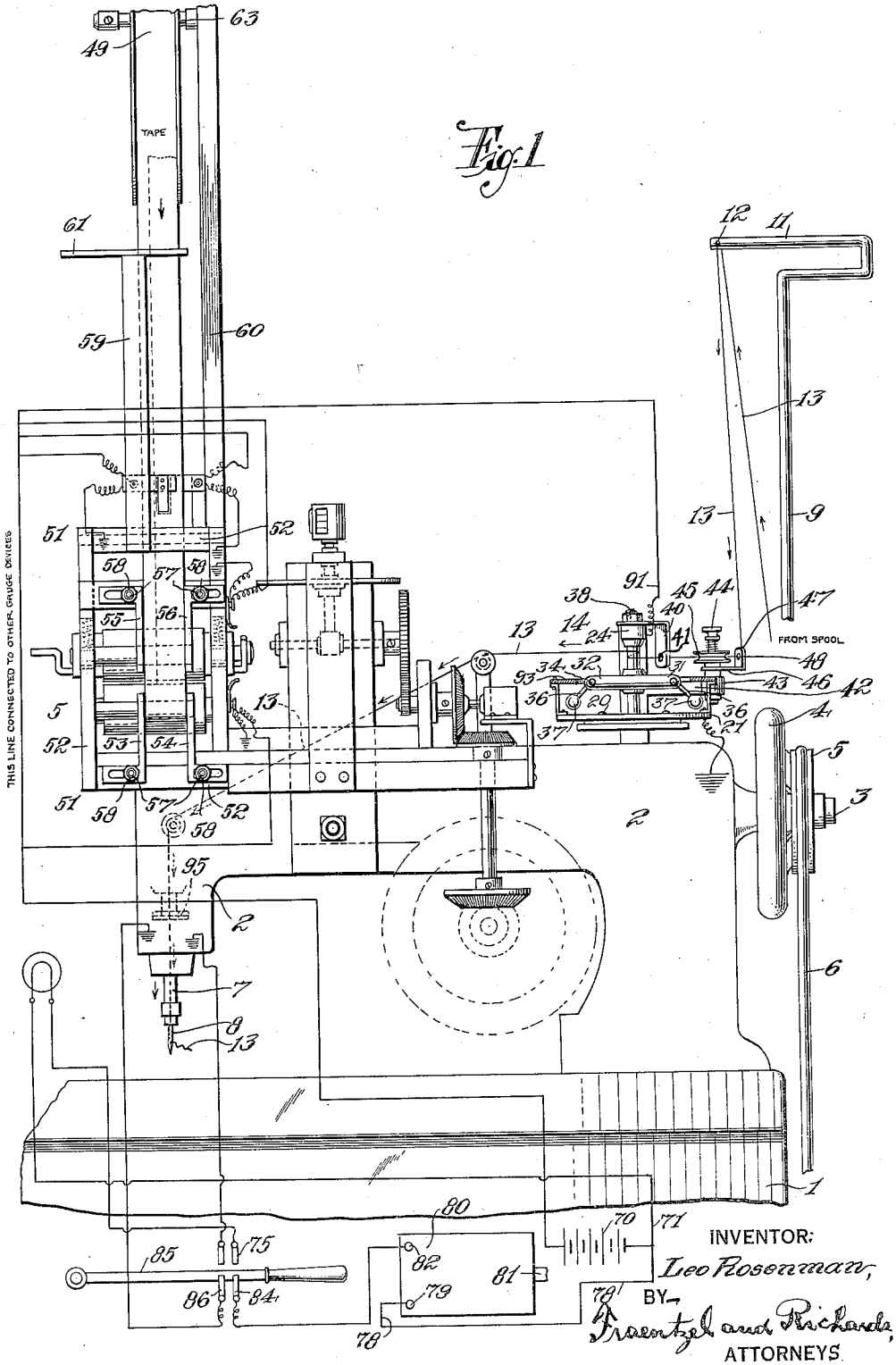
Nov. 1, 1927. 1,647,148

L. ROSENMAN

SEWING MACHINE

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L. ROSENMAN

SEWING MACHINE

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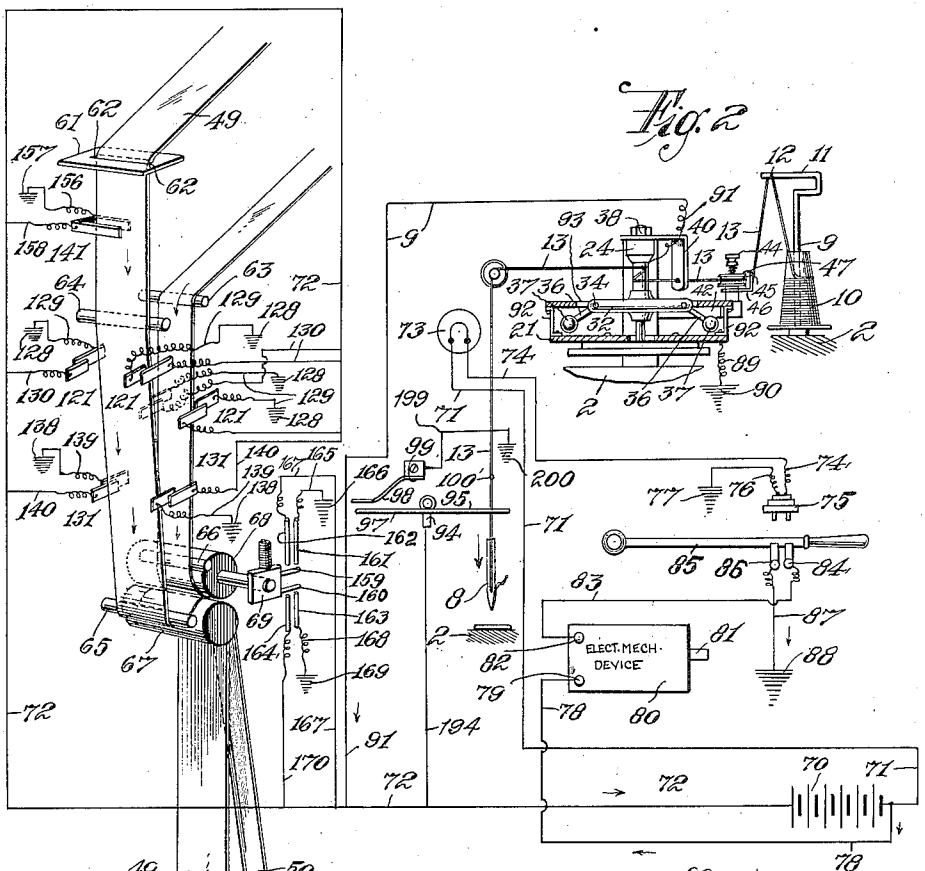


Fig. 2

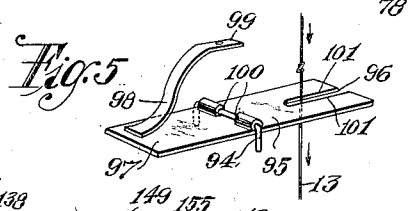


Fig. 5

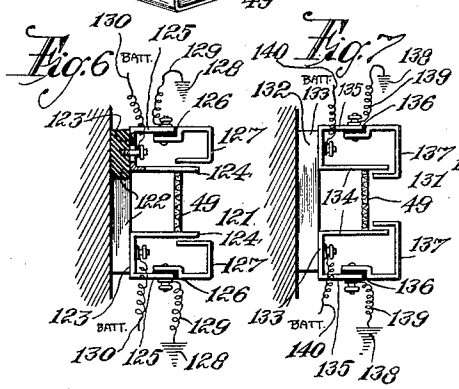


Fig. 6

Fig. 7

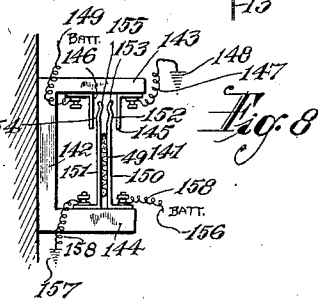


Fig. 8

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SEWING MACHINE

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Fig. 4

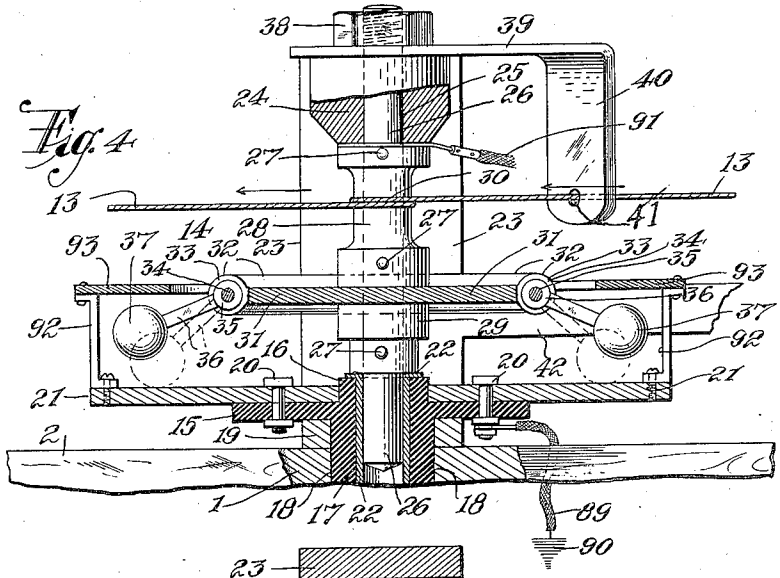
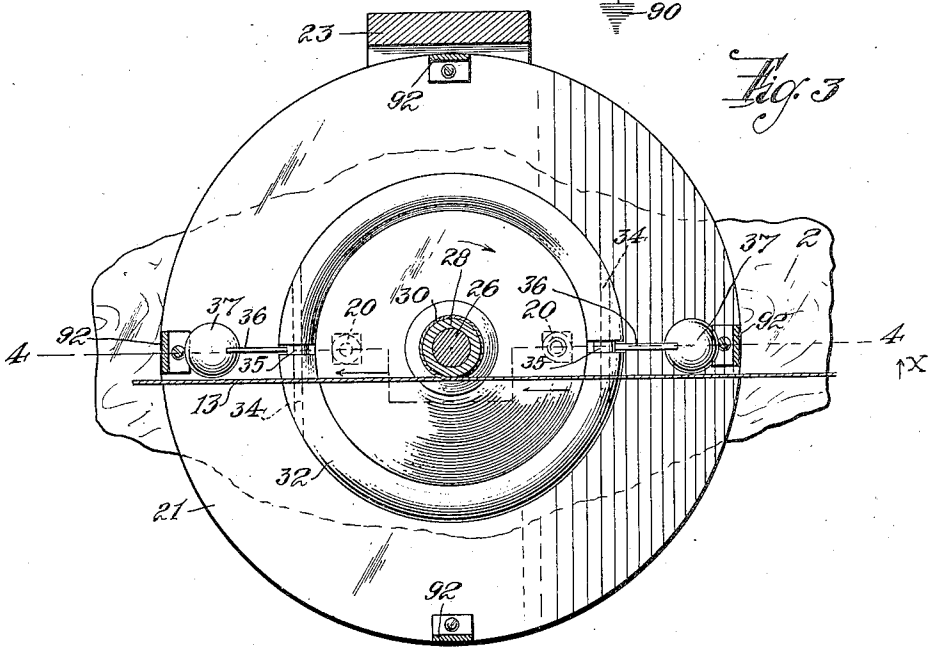


Fig. 3



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SEWING MACHINE

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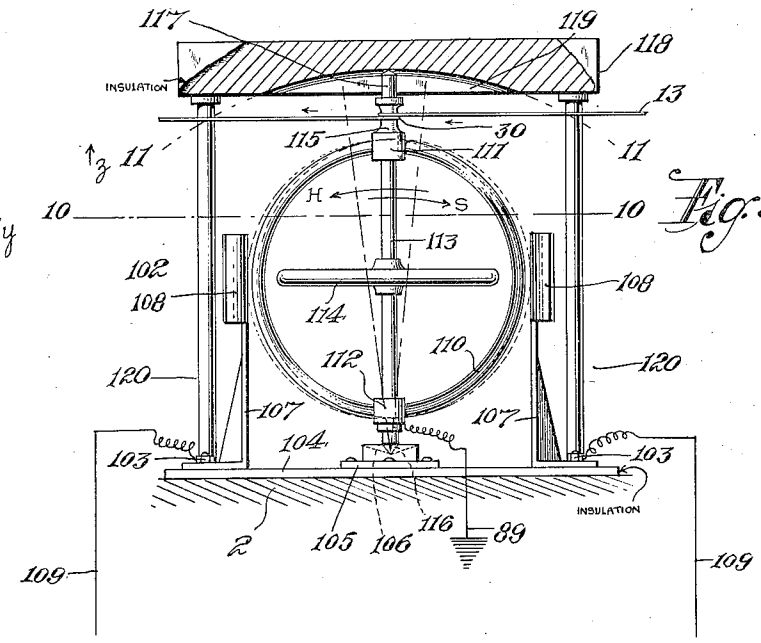


Fig. 9

Fig. 10

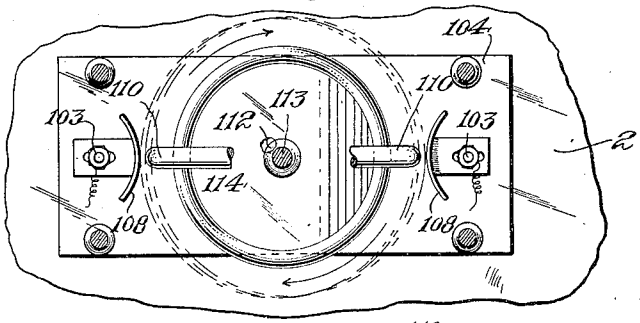
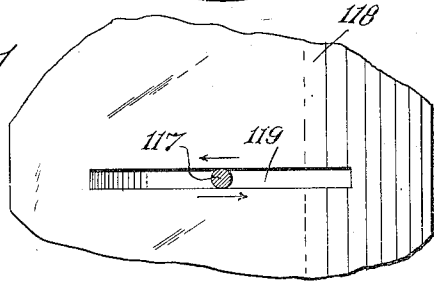


Fig. 11



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UNITED STATES PATENT OFFICE.

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SEWING MACHINE.

Application filed April 11, 1923. Serial No. 631,251.

This invention relates, generally, to improvements in sewing machines; and, the present invention has reference, more particularly, to a novel mechanism, in the form of an attachment to power-driven machines, performing what may be termed automatic running of the sewing machine, without any special attention of an operator after the machine has been started for automatically arresting or stopping the operation of the machine, in case of any faulty stitching, or when the sewing thread becomes broken, or in case there is a knot in the thread, or due to any entanglement of the thread, or the like; the invention being especially applicable to that class of sewing machines which are used for sewing strip-members together for the purpose of producing flies or strips for garments, to be provided with hooks and eyes.

The principal object of the present invention, therefore, is to provide an attachment applicable to a sewing machine, which is driven by the moving sewing thread, and said attachment acting either in the manner of a centrifugal governor, or in the manner of a gyroscope, and which attachment, when a faulty or loose stitching or other thread-interruption takes place, acting to produce an electrical circuit which automatically cuts out the motive power employed for driving the operating mechanism of the sewing machine.

The present invention has for its further object to provide in connection with a sewing machine, means which is actuated by a knot that may be formed in the sewing thread for automatically arresting or stopping the sewing operation of the machine.

Briefly:—The present invention is primarily adapted for use with sewing machines producing what is known as the lock-stitch, such lock-stitching comprising the use of two threads, namely, the lower or bobbin-thread and the upper or needle-thread, this latter thread in the present invention being employed, as it is being fed to the needle of the sewing machine, to actuate a spindle of the electrical contact-making and breaking mechanism mentioned, and causing said mechanism to establish electrical contact under certain conditions of said lower and upper threads when they are not working in unison, that is when the bobbin carrying the lower thread becomes empty, or when the lower thread breaks, or when the tension on the lower thread is loose, thus using less lower thread, and causing an excessive or greater tension upon the upper thread; or vice versa, when the tension on the lower thread is excessive, and greater than that of the upper thread.

Thus, under faulty conditions, such as above mentioned, the spindle of the contact-making device may be rotated faster or slower, according to length of the upper thread passing around the spindle in a given time, so that both a faster rotation of the spindle, as well as a slower rotation of the spindle will cause the device to establish an electric circuit which will actuate the throw-out mechanism of the sewing machine, whereby its operation will be arrested or stopped.

Other objects of the present invention not at this time more particularly enumerated will be clearly understood from the following detailed description of the present invention.

With the various objects of the present invention in view, the said invention consists, primarily, in the novel attachments applied to a sewing machine for automatically arrecting or stopping the stitching or sewing operation of the sewing-machine, when there is a faulty or loose stitching operation, or when there are other thread-interruptions, due to a broken thread, or to a knot in the thread, or other entanglement of the thread, hereinafter more fully set forth, as well as in the mechanical and electrical devices co-operating therewith for producing the desired results; and the invention consists, furthermore, in the novel arrangements and combinations of the various devices and parts, as well as in the details of the construction of the said parts, all of which will be more fully described in the following specification, and then finally embodied in the clauses of the claims which are appended to, and which form an essential part of the said specification.

The invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a front elevation of a sewing machine employed in the sewing together of strips, such as are used with garment-fasteners, as hooks and eyes, and which are known in the art as garment-strips or flies, said

view showing in connection therewith, in a diagrammatic manner, one embodiment of devices and parts arranged according to and embodying the principles of the present invention.

Figure 2 is another diagrammatic representation of the various devices and parts employed with the sewing machine, according to the principles of the present invention, said view illustrating more particularly in connection with the said devices and parts, certain electrical circuits employed in the interruption of the sewing operation of the machine at certain times.

Figure 3 is a plan view, and Figure 4 is a vertical representation of the same, taken on line 4—4 in said Figure 3, and looking in the direction of the arrow *x*, of a rotary electrical make and break device, for arresting the sewing operation of the sewing machine, said views being made on an enlarged scale.

Figures 5, 6, 7 and 8 are detail views, made on enlarged scales, of certain interrupter devices, employed with the sewing machine.

Figure 9 is a side elevation of another electrical make and break device, adapted to act in the manner of a gyroscope, and adapted for use in lieu of the device represented in said Figures 3 and 4; Figure 10 is a horizontal sectional representation of the same, said section being taken on line 10—10 in said Figure 9, looking in the direction of the arrow *y*; and Figure 11 is another sectional representation, taken on line 11—11 in said Figure 9, looking in the direction of the arrow *z*.

Similar characters of reference are employed in all of the said above described views, to indicate corresponding parts.

Referring now to the several figures of the drawings, the reference-character 1 indicates the usual base or bench, and 2 the main frame in which is contained the operating mechanism of the sewing machine provided with the usual driving spindle or shaft 3, the starting wheel 4, and grooved pulley 5, over which is passed a driving belt 6 which is actuated from a suitable source of power, for operating the mechanism of the sewing machine, and in turn actuating the reciprocating needle-holder 7 in which is secured in the usual manner, the thread-receiving sewing needle 8. At a suitable point upon the main frame of the sewing machine, or upon the bench upon which the machine is mounted, or in any other suitable position, is a spool-receiving means, as 9, upon which is rotatably mounted, the usual spool of thread 10. Usually this means 9 is in the form of an upwardly extending rod or post provided at its upper extremity with an angularly extending finger or member, as 11, provided with a perforation or eye 12 through which the thread 13 is passed, as it comes from the spool 10.

The previously mentioned make and break device, which is shown more particularly in Figures 1, 2, 3 and 4 of the drawings, is indicated in general by the reference-character 14, and the same is suitably mounted upon the main frame 2 of the sewing machine. As shown, this device comprises a disc or plate 15 of insulating material provided with suitably formed tubular members or hub-portions, as 16 and 17 extending on opposite sides of the said disc or plate 15, the hub-portion 17 being secured against rotary motion in a suitably disposed hole, as 18, with which the upper portion of the said frame 2 may be provided. Suitably disposed between the said disc or plate 15 and the said frame 2, and encircling the said hub-portion 17, may be a ring or washer 19 of metal, or any other suitable material.

Suitably secured upon said disc or plate 15 by means of bolts 20, or in any other suitable manner, is a larger ring or disc 21 of metal, this disc or plate being centrally disposed upon the hub-portion 16 of the said disc or plate 15. A tubular sleeve 22 may also be arranged in the tubular portion of the said disc or plate 15 and its hub-portions 16 and 17, substantially as shown in said Figure 4 of the drawings. Suitably mounted upon the main frame 2 of the sewing machine, and extending in the upward direction, at one side of the metal disc or plate 21 is a bracket 23 formed at its upper end-portion with a forwardly extending member 24 having a bearing-portion as 25, in alinement vertically with the bearing-portion provided by the tubular sleeve 22. Rotatably mounted in the bearing-portions, thus provided, is a spindle 26, upon which are suitably mounted and secured by means of pins 27, or other suitable fastening means, suitably shaped sleeves, as 28 and 29, the said sleeve 28 being preferably made in the form of a spool about which the thread 13 is wound, as at 30, and whereby, the movement of the upper or needle-thread 13, in the direction of the arrows, indicated in Figures 3 and 4 of the drawings, will produce rotation of the spindle 26 and the parts mounted thereon, as will be evident. The said spindle 26 has also suitably mounted thereon, and held in position upon said spindle 26, so as to turn with the same, a centrifugal disc 31, formed at its marginal edge with a weighted rim, as 32. At opposite sides, the said rim is provided with slots or cut-away portions, as 33, across which extend portions of suitable pivot-pins 34 upon which are pivotally or oscillatorily mounted the eyes 35 of links or arms 36, each link or eye being further provided at its free end with a weight or ball 37, similar in its construction to that of a centrifugal governor. Secured

in a suitable position upon the upper surface of said member 24, by means of a stud 38, or other suitable fastening means, is a plate 39 having a downwardly projecting member 40 which is provided with a perforation 41, through which the thread 13 is passed, as is clearly evident. If desired, the previously mentioned bracket 23 may also be provided with a laterally extending member 42 provided at its free end with a bearing-portion 43 in which is secured the lower portion of a stud 44 upon which is rotatably mounted a grooved wheel 45 over which the thread 13 may be passed. The said stud 44 is also provided with a laterally extending plate 46 having an upwardly projecting member 47 which is provided with a perforation 48, through which the thread 13 is passed for its proper guidance to the said grooved wheel 45. From the said sleeve or spool 28 the thread 13 is guided in any suitable manner to the needle-holder and is inserted in the eye of the needle for the usual sewing operation.

While my present invention is applicable to sewing machines of the various kinds, it is especially adapted for use with that class of power-driven sewing machines which are employed for variously sewing one tape or strip 49 to another tape or strip 50, for the reception of garment-fasteners, such as hooks and eyes, to provide what is known in the trade as garment strips or flies. Thus, as is shown in Figure 1 of the drawings, the frame 2 of the sewing machine is suitably provided in the proper place, near the sewing needle, with a tape-guide, as 51, the same comprising a suitably constructed frame 52 carrying certain guide-members 53, 54, 55 and 56, adjustably mounted upon suitable studs or pins 57 with which the said frame 52 is provided, each stud or pin being provided with a tightening nut 58 for securing said guide-members in their adjusted positions. Connected with and extending upwardly from said frame 52, are a pair of uprights, as 59 and 60, the upright 59 being provided upon its upper end with a plate 61 formed with a slot, as 62, through which the tape or strip 49 is passed, and the other upright 60 being provided at its upper end-portion with a suitably formed guide-roller, as 63, over which the other tape or strip 50 is passed. It will be understood, however, that in lieu of the said guide-plate 61 and the said guide-roller 63, any other suitably constructed tape-guiding means may be employed.

Other guide-rollers, as 64, 65 and 66 may also be provided, and the tapes or strips may be passed between a pair of tension-rolls, as 67 and 68, one of which, as 67, is rotatably journalled in fixed bearings mounted in the frame 52, while the other roller 68 is rotatably journaled in spring-controlled bearings, as 69, movably mounted in the frame 52, so that the said roller 68 may have a resilient rotary relation to the fixed rotary position of the roller 67, as will be clearly evident.

Having in the foregoing description set forth, in combination with the mechanism of a sewing machine, diagrammatically, one general arrangement of mechanical devices used with my present invention, I will now set forth an arrangement of electrical circuits and certain electrical instrumentalities co-operating with said mechanical devices for completing and making certain electrical circuits whereby the operation of the machine is automatically arrested when there is a faulty or loose stitching operation of the sewing machine, or when there are other thread-interruptions, due to a knot, or a break, or an entanglement in the upper or needle-thread 13, or due to an empty bobbin, which ordinarily causes a slowing down of the mechanism of the machine; or when there are other interruptions adapted to be caused by an increase or decrease in the thickness of the tapes, or due to an increase or a decrease in the widths of the tapes owing to a faulty folding of the marginal edge-portions of the tapes, or when the tapes, which are cut prior to being fed into the sewing machine, are either too wide or too narrow.

Referring now more particularly to Figures 1 and 2 of the drawings, the reference-character 70 indicates a suitable battery, or other source of electricity, with the respective end-terminals of which are connected the circuit-wires 71 and 72, the wire 71 leading to and being connected with a signal-lamp 73, or other suitable signalling device. Leading from said signalling device 73 is a circuit-wire 74, which is attached to a contact-establishing device, as 75, having a leading-out wire 76 which is grounded, as at 77. Connected with and leading from the wire 71 is a circuit-wire 78 which is attached to the terminal 79 of an electro-mechanical switch 80 provided with a contact-making lever 81. Connected with and leading from the terminal 82 of said device 80 is a leading-out wire 83 which is attached to a switch-terminal 84. The reference-character 86 indicates another switch-terminal, and 85 is a pivoted and manually operated lever, adapted when in the positions shown in said Figures 1 and 2 of the drawings to establish electrical contact between the said switch-terminals 84 and 86. Connected with and leading from said switch-terminal 86 is a wire 87 which is grounded, as at 88. Connected with and leading from the fixed metal disc or plate 21 of the device 14 is a circuit-wire 89, which is also grounded, as at 99, and suitably connected with the spindle 26 is a leading-out circuit-wire 91, leading to and electrically connected with the battery-wire 72. As shown, the fixed disc or plate 21 is

also provided with upwardly extending posts 92 carrying upon their upper extremities a circular ring or plate, as 93. Under a reduced speed of the spindle 26, the weights or balls 37 of the links 36 naturally will be brought into sliding contact with the upper surface of the plate 21, and due to an increased speed of said spindle 26, the said weights or balls 37 are brought into a sliding contact with the lower surface of the ring or plate 93.

Now, let us suppose that the sewing machine is running at the usual proper speed, and that the upper sewing thread 13, as it is being fed from the spool 10 to the needle 8 presents no obstructions. When everything is running in perfect order, the turn or loop-portion 30 of the thread 13 acts upon the sleeve or spool 28 of the centrifugal make and break device 14 in such manner that the rotary disc or plate 31 and the spindle 26 will revolve in unison with the movement of the thread 13, and at a normal speed which causes the links 36 and their weights or balls 37 to swing outwardly into such positions, that they will not come in sliding contact with either the said ring or plate 93, or with the disc 21.

It has been found in practice, that when the lower or bobbin-thread and the upper or needle-thread do not work in unison an excessive tension on the lower thread in a given time causes a greater length of the upper thread to be used, thus increasing the rotation of the spindle 26, and that when the bobbin is emptied of the lower thread, or the lower thread becomes broken or loose, then in the given time less length of the upper thread is used, thus decreasing the rotation of the spindle 26.

In the first instance, the primary result will be that the speed of the disc or plate 31 increases, so that the balls or weights will move outwardly and upwardly, being thereby brought in contact with the lower surface of the ring or plate 93. A complete electric circuit is thereby established from the battery 70, through the wire 78, the electro-mechanical switch 80, the wire 83, the switch 85, the wire 87, to the ground 88, thence from the ground 90, through the wire 89, the disc or plate 21, the posts 92, the ring 93, the balls or weight 37 and the links 36, through the disc or plate 31, the spindle 26, the wire 91, and the wire 72, back to the battery 70. Immediately, upon completion of this electric circuit, the mechanism of the device 80 is actuated, so that the lever 81 is thrown in such manner as to automatically throw out the clutch-mechanism of the sewing-machine, so that the sewing operation of the machine is arrested. In the second instance, when there is less length of the upper thread used, the rotation of the spindle 26 decreases, thereby permitting the balls or weights 37 to drop downwardly making contact with the upper surface of the disc or plate 21. Thereupon, a complete electric circuit is established from the battery 70, through the wire 78, the electro-mechanical switch 80, the wire 83, the switch 85, the wire 87, to the ground 88, thence from the ground 90, through the wire 89, the disc or plate 21, the balls or weights 37 and links 36, through the disc or plate 31, the spindle 26, the wire 91, and the wire 72, back to the battery 70. A complete electrical circuit is thus again established which also actuates the mechanism of the device 80, so that the sewing operation of the machine is arrested.

As the circuit for the signal lamp 73 is shown in the drawing, said signal lamp may be substituted for the control device 80 in circuit with the centrifugal make and break device by throwing the switch lever 85 out of engagement with the contacts 84 and 86 and into engagement with the contact establishing device 75. Under such circumstances the machine will not be stopped upon closing of the centrifugal make and break device, but instead the lamp 73 will be flashed on the occurrence of any of the various imperfections in the operation of the machine heretofore and subsequently referred to. It will be understood, however, that should it be desirable to simultaneously light the signal lamp 73 upon occurrence of an automatic stoppage of the machine, such effect may be obtained by simply grounding the lead out wire 74 of the lamp, in which case the lamp will be connected in shunt with the control device 80, and a closing of the centrifugal make and break device will complete the electric circuit so as to both actuate the control device 80 and light the lamp 73.

In lieu of the centrifugal contact-making and breaking device 14 hereinabove described, I may use a contact making and breaking device made in the form and acting in the manner of a gyroscope. One form of gyroscope is indicated in Figures 9, 10 and 11 of the drawing, the same being indicated in general by the reference-character 102. As shown, there is secured in the proper position upon the frame 2 of the sewing machine, by means of bolts 103, or other suitable fastening means, a plate 104 of insulating material, this plate having suitably mounted thereon a bearing-member, as 105, formed in its upper surface with a depression 106, as indicated in dotted outline in Figure 9 of the drawings. Also mounted upon said plate 104, and secured thereon by means of bolts 103, are a pair of uprights, as 107, provided at their upper end-portions with contact-plates 108. Circuit-wires 109 lead from the said bolts 103 to the return-circuit wires 91 used in connection with the circuit-wire 72 and the negative pole of the electric battery 70.

The reference-character 110 indicates a suitable ring provided with oppositely disposed bearings 111 and 112 in which is rotatably mounted a spindle 113 having fixed thereon, so as to be rotatably disposed within the ring 110, a disc 114. Suitably secured upon the said spindle 113, so as to rotate therewith, and located upon said spindle at a point above the said bearing 111, is a spool 115 about which the turn or looped portion 30 of the sewing thread 13 is arranged, as shown in said Figure 9 of the drawings. The lower pointed end 116 of the spindle 113 rests upon and is rotatably disposed in the depression 106 of the bearing-member 105, and the upper end-portion 117 of the spindle extends into, and is rotatably as well as oscillatorily disposed in an arc-shaped depression 119 of a plate or member 118 which is mounted above the plate 104, and the various members of the gyroscope by means of standards or posts 120. The plate 118 is also made of insulating material.

Connected with and extending from the bearing 112 is the circuit-wire 89 which is grounded to the frame-work of the machine, as at 90, in the manner of the device shown in Figures 1, 2 and 3 of the drawings, and for the purposes heretofore described in connection with said figures.

Of course it will be evident, that when the sewing machine is running at the proper speed, the gyroscope will operate properly, so that no electrical contact between the ring 110 and either of the contact-plates 108 is made; but when the speed of the disc 114 is such that the ring 110 moves laterally so as to contact with either of the said plates, due to the interfering causes mentioned hereinabove in connection with the device shown in said Figures 1, 2 and 3 of the drawings, a complete electrical circuit will be established, which actuates the heretofore mentioned electro-mechanical device 80, and which in turn arrests the sewing operation, automatically, of the sewing machine.

In addition to the devices hereinbefore described, I have oscillatorily mounted upon a support 94, secured in a suitable position upon the frame 2 of the sewing machine, and suitably insulated therefrom, a plate or element, as 95, which is provided at one end-portion with a slit 96, or the like, said plate having its other end-portion 97 adapted to be brought into contact with a suitably formed leaf-spring 98, or the like, which is suitably secured at its end-portion 99 to some suitable part of the frame 2 of the sewing machine. Leading from the support 94 is a circuit wire 194, said circuit wire being connected in circuit with the circuit wire 72 leading in return to the electric battery 70. Connected with and leading from the end-portion 99 of the electrical contact element or spring 98 is a circuit-wire 199 which is grounded with the sewing machine, as at 200.

The upper or needle-thread 13, as will be seen from an inspection of Figures 2 and 5 of the drawings, in its passage from the device 14 to the needle 8, and through the eye of the needle, also passes through the slit 96 of the pivoted plate or element 95. However, when there is a knot in the thread 13, as at 100, or another obstruction, as unravelled or loose thread-portions, when these portions or the knot move in contact with the marginal edges 101 which bound said slit 96 in the plate 95, the result will be that the end-portion 97 of the pivot-plate 95 will engage the free end-portion of the contact-element or spring 98. Immediately a complete electric circuit is established from the battery 70, through the wire 78, the electro-mechanical switch 80, the wire 83, the switch 85, the wire 87, to the ground 88, thence from the ground 200, through the wire 199, the contacting members 98 and 95, through the wire 194, and the wire 72 back to the battery 70. Upon completion of this electric circuit, the mechanism of the device 80 is thrown in a manner to automatically throw out the clutch-mechanism of the sewing machine, so that the sewing operation of the machine will again be arrested.

In addition, I have also provided means for automatically arresting the operation of the sewing machine, when the garment fastener strips or bands 49 and 50 which are to be sewed together, vary in their width, when either too wide or too narrow, or when varying in thickness, when either too thick or too thin.

Such means is shown more particularly in the several Figures 2, 6, 7 and 8 of the drawings.

In Figure 6 there is shown a construction of a circuit-making and breaking device 121 for establishing an electric circuit through the battery 70, the electro-mechanical device 80, the said device 121, the sewing-machine frame, and the connecting circuit-wires, when the strip or band is of greater width than desired. In said Figure 6 I have shown the said device 121 used in connection with the wide strip 49, but another circuit-making and breaking device of the same construction may also be used with the narrow strip or band 50, as will be evident.

As shown in said Figure 6, the device 121 comprises a base-plate 122 of insulating material, suitably attached to the members of the previously-mentioned tape-guide, and a pair of metal elements 123 formed with the outwardly extending members 124 and 125. Connected with each member 125, but insulated therefrom, as at 126, are other members, as 127, with which the free end-portions of the members 124 are adapted to be brought in contact by the marginal edges

of the tape or strip as it passes between the said members 124, when the width of the strip or tape is greater than desired. When contact is made between the members 124 and 127, a complete electric circuit is established from the battery 70, through wire 78, through the electro-mechanical device 80, the wire 83, the switch-lever 85, the wire 87 and ground 88 to the ground 128, see Figure 6, through the wire 129, through the contacting members 124 and 127 of the device 121, and out through a wire 130, connected with the main circuit-wire 72, back to the battery 70, whereby, as soon as such electrical circuit is established, the electro-mechanical device 80 is actuated, so that it will cause the arrest or stopping of the operation of the mechanism of the sewing machine.

In Figure 7 of the drawings, is shown a circuit-making and breaking device, as 131, similar in its construction to the device 121, but acting in a reverse manner to cause an electrical circuit to be established, when the tape or strip is too narrow.

As shown in said Figure 7, the device 131 comprises a base-plate 132 of insulating material, also suitably attached to the members of the previously-mentioned tape-guide, and a pair of elements 133 formed with outwardly extending members 134 and 135. Connected with each member 135, but insulated therefrom, as at 136, are other members, as 137, with which the free end-portions of the members 134 are adapted to be brought in contact owing to the spring action of said members 134 toward each other, when the width of the passing tape or strip is less than desired. When contact is made between the members 134 and 137, a complete electric circuit is established from the battery 70, through wire 78, through the electro-mechanical device 80, the wire 83, the switch-lever 85, the wire 87 and ground 88 to the ground 138, see Figure 7, through the wire 139, through the contacting members 134 and 137 of the device 131, and out through the wire 140, connected with the main circuit-wire 72, back to the battery 70, whereby, as soon as this electrical circuit is completed, the electro-mechanical device is actuated, so that it will cause the arrest or stopping of the operation of the mechanism of the sewing machine.

In Figure 8 of the drawings, is shown another circuit-making and braking device, as 141, which is used as a means for automatically stopping the operating of the sewing machine, either in case the thickness of the tape or strip is too thick, or too thin.

Referring now to said Figure 8, the reference-character 142 indicates a base-plate which is made of a suitable insulating material, said plate being formed with a pair of forwardly extending arms or members 143 and 144, and the said base-plate being adapted to be suitably attached to the members of the previously mentioned tape-guide.

Suitably secured to the arm or member 143 is a pair of inwardly extending contact members, as 145 and 146, with one of which, as 145 is connected a wire 147 which is grounded with the frame of the sewing machine, as at 148. Connected with the other contact-member 146 is a circuit-wire 149 which leads to and is suitably connected with the main circuit-wire 72. Suitably secured to the other arm or member 144 is another pair of inwardly extending contact-members, as 150 and 151, the free end-portions of said members 150 and 151 terminating between the said inwardly extending contact members 145 and 146, as shown. At its free end-portion, the contact-member 150 is made with an outwardly curved contact making portion 152 and with an inwardly curved contact-making portion 153. Similarly, at its free end-portion, the contact-member 151 is made with an outwardly curved contact-making portion 154, and an inwardly curved contact-making portion 155. The contact-member 150 has attached thereto a wire 156 which leads to and is suitably connected with the main circuit-wire 72, and attached to the contact-member 151 is a circuit-wire 158 which is grounded with the frame of the sewing-machine, as at 157.

In case, the strip 49, or for that matter the strip 50, as it passes between the contact-members 150 and 151 is too thick, these members will be forced apart, so that their outwardly curved portions 152 and 154 will make contact, respectively, with the members 145 and 146. A complete electric circuit is thus established from the battery 70, through wire 78, through the electro-mechanical device 80, the wire 83, the switch-lever 85, the wire 87 and ground 88 to the ground 148, see Figure 8, through the wire 147, the contacting member 150, thence through the circuit-wire 156 and through the main circuit-wire 72, back to the battery 70, whereby an electrical circuit is completed, and the electro-mechanical device is actuated, so that it will once more cause the arrest or stopping of the operation of the mechanism of the sewing machine, Similarly, a complete electric circuit may be established from the battery 70 to the ground 157, through the wire 158, the contacting members 151 and 146, and thence by means of the wire 149 back to the battery 70. In a like manner, if the strip or tape is too thin, the spring-action of the two members 150 and 151 is such, that their inwardly extending curved end-portions 153 and 155 will be brought in contact, as will be evident, thereby establishing a complete electric circuit from the battery 70, through wire 78, through the electro-mechanical device 80, the wire 83, the

switch-lever 85, the wire 87 and ground 88 to the ground 157, see said Figure 8, through the wire 156, the contatcing members 150 and 151, and out through the wire 158, connected with the main circuit-wire 72 back to the battery, and whereby, as soon as this electrical circuit is completed, the electro-mechanical device is again actuated, so that it will cause the arrest or stopping of the operation of the mechanism of the sewing machine.

As has been previously stated, the roll 68 rotates in vibratory bearings 69, the main purpose being to move the roll 68 in a direction away from the roll 67 when the combined thickness of the tapes 49 and 50 is greater than the thickness desired, or to move the said roll 68 closer to the roll 67 when the combined thickness of the tapes is less than that desired. Extending from the bearing-plate 69 are a pair of contact-making fingers 159 and 160, the finger 159 being adapted to move between the contact-members 161 and 162, when the roll 68 moves away from the roll 67, and the finger 160 being adapted to move between the contact-members 163 and 164, when the roll 68 moves toward the roll 67. Leading from the member 161 is a wire 165 which is grounded, as at 166, and leading from the member 162 is a wire 167 which is connected with the main circuit-wire 72. Likewise, a wire 168 leads from the contact-member 163, said wire 168 being grounded, as at 169, and leading from the contact-member 164 is a wire 170 which is connected with the main circuit-wire 72.

Thus, when contact is made between the finger 159 and the members 161 and 162, a complete electrical circuit is established from the battery 70, through the wire 78, through the electro-mechanical device 80, the wire 83, the switch-lever 85, the wire 87 and ground 88 to the ground 166, see Figure 2, through the wire 165, the contacting members 161, 159 and 162, and through the wire 167 connected with the main circuit-wire 72 back to the battery 70, whereby an electric circuit is completed, and the electro-mechanical device is again actuated, so that it will cause the arrest or stopping of the operation of the mechanism of the sewing machine. In a like manner, when contact is made between the finger 160 and the members 164 and 164, a complete electric circuit is established from the battery 70, through the wire 78, through the electro-mechanical device 80, the wire 83, the switch-lever 85, the wire 87 and ground 88 to the ground 169, see said Figure 2, through the wire 168, the contacting members 163, 160 and 164, and through the wire 170 connected with the main circuit-wire 72 back to the battery 70, whereby an electric circuit is again completed, so that the electro-mechanical device is once more actuated, and thereby causes the arrest or stopping of the operation of the mechanism of the sewing machine.

While in the foregoing I have described in a general manner, the means for variously arresting or stopping automatically the mechanism of that class of sewing machines for stitching or sewing together garment-strips or tapes to which are applied garment fasteners, such as hooks and eyes, it will be evident that the various arresting or stopping means may be employed in conjunction with the mechanism of sewing machines employed for other sewing purposes, or with machines of a similar nature.

I am also fully aware, that changes may be made in the general arrangements and combinations of the various devices and parts, as well as in the details of the construction of the said parts, without departing from the scope of the present invention, as set forth in the foregoing specification, and as defined in the clauses of the claims which are appended to the said specification. Hence, I do not limit my present invention to the exact arrangements and combinations of the various devices and parts, as described in the said specification, nor do I confine myself to the exact details of the construction of the said parts, as illustrated in the accompanying drawings.

I claim:—

1. In a sewing machine, in combination with the sewing mechanism thereof, a rotary means having a spindle about which the thread passing to said sewing mechanism is wound so as to actuate said rotary means for automatically arresting the operation of the sewing mechanism as the speed of said rotary means is increased or decreased from a predetermined normal speed, due to a faulty or loose stitching operation.

2. In a sewing machine in combination with the mechanism thereof, a rotary means actuated by the sewing thread of the machine, said means automatically arresting the operation of the mechanism of the machine as the speed of the rotary means is increased or decreased from a predetermined normal speed, due to a faulty or loose stitching operation.

3. In a sewing machine, the combination with the sewing mechanism thereof, of means including a rotary spindle about which the thread is wound for revolving said spindle, said means coming into operation upon the occurrence of a faulty or loose stitching operation for automatically arresting the operation of said sewing mechanism.

4. In a sewing machine, the combination with the sewing mechanism thereof, of means including a rotary spindle about which the thread is wound for revolving said spindle, a disc mounted upon said spindle so as to ro-

tate therewith, and a stopping means cooperating with said spindle and disc, said stopping means coming into operation upon the occurrence of a faulty or loose stitching operation for automatically arresting the operation of the sewing machine.

5. In combination with a sewing machine, means for automatically arresting the operation thereof, comprising an electro-mechanical power transmission control, a source of electrical energy for actuating said control, an electric circuit connecting said source and control, and said circuit including a rotary circuit make and break device adapted to be actuated by the movement of thread to the stitch forming mechanism of the machine so as to remain open during movement of said thread at normal speed but adapted to close when said movement is abnormally increased or decreased.

6. In combination with a sewing machine, means for automatically arresting the operation thereof, comprising an electro-mechanical power transmission control, a source of electrical energy for actuating said control, an electric circuit connecting said source and control, and a centrifugal make and break means to control said circuit, said make and break means having a spindle about which the thread passing to the stitching mechanism of the machine is wound so as to transmit rotary motion to said spindle of said centrifugal make and break means whereby the latter remains open during movement of said thread at normal speed but closes when said movement is abnormally increased or decreased.

7. In a sewing machine, the combination with the sewing mechanism thereof, of electrically actuated means for arresting the operation of said machine, and a centrifugal make and break device in circuit with said arresting means, said make and break device comprising a rotary spindle about which the sewing thread is wound for rotating said spindle, a disc mounted on said spindle to rotate therewith, a stationary contact means insulated from said spindle and disc, and centrifugally actuated means carried by said disc to cooperate with said stationary contact means.

8. In a sewing machine, the combination with the sewing mechanism thereof, of electrically actuated means for arresting the operation of said machine, and a centrifugal make and break device in circuit with said arresting means, said make and break device comprising a rotary spindle about which the sewing thread is wound for rotating said spindle, a disc mounted on said spindle to rotate therewith, centrifugally actuated contact means carried by said disc, and stationary contact means above and below said centrifugally actuated contact means with which the latter selectively cooperate when the rotary movement of said disc is abnormally increased or decreased.

9. In combination with a sewing machine, means for automatically arresting the operation thereof, comprising an electro-mechanical power transmission control, a source of electrical energy for actuating said control, an electric circuit connecting said source and control, and a centrifugal make and break means in said circuit, comprising a rotary spindle about which the sewing thread is wound for rotating said spindle, a disc mounted on said spindle to rotate therewith, centrifugally actuated contact weights oscillatorily connected with said rotatable disc, and stationary contact means with which said contact weights may cooperate.

10. In combination with a sewing machine, means for automatically arresting the operation thereof, comprising an electro-mechanical power transmission control, a source of electrical energy for actuating said control, an electric circuit connecting said source and control, and a centrifugal make and break means in said circuit, comprising a rotary spindle about which the sewing thread is wound for rotating said spindle, a disc mounted on said spindle to rotate therewith, centrifugally actuated contact weights oscillatorily connected with said rotatable disc, and a stationary contact means above and below said contact weights with which the latter selectively cooperate when the rotary movement of said rotatable disc is abnormally increased or decreased.

In testimony that I claim the invention set forth above I have hereunto set my hand this 4th day of April, 1923.

LEO ROSENMAN.