D. NOBLE & J. S. FINCH.

STOP MOTION MECHANISM FOR SEWING MACHINES.

APPLICATION FILED DEC. 19, 1906.

1,047,111.

Patented Dec. 10, 1912.

6 SHEETS—SHEET 1.

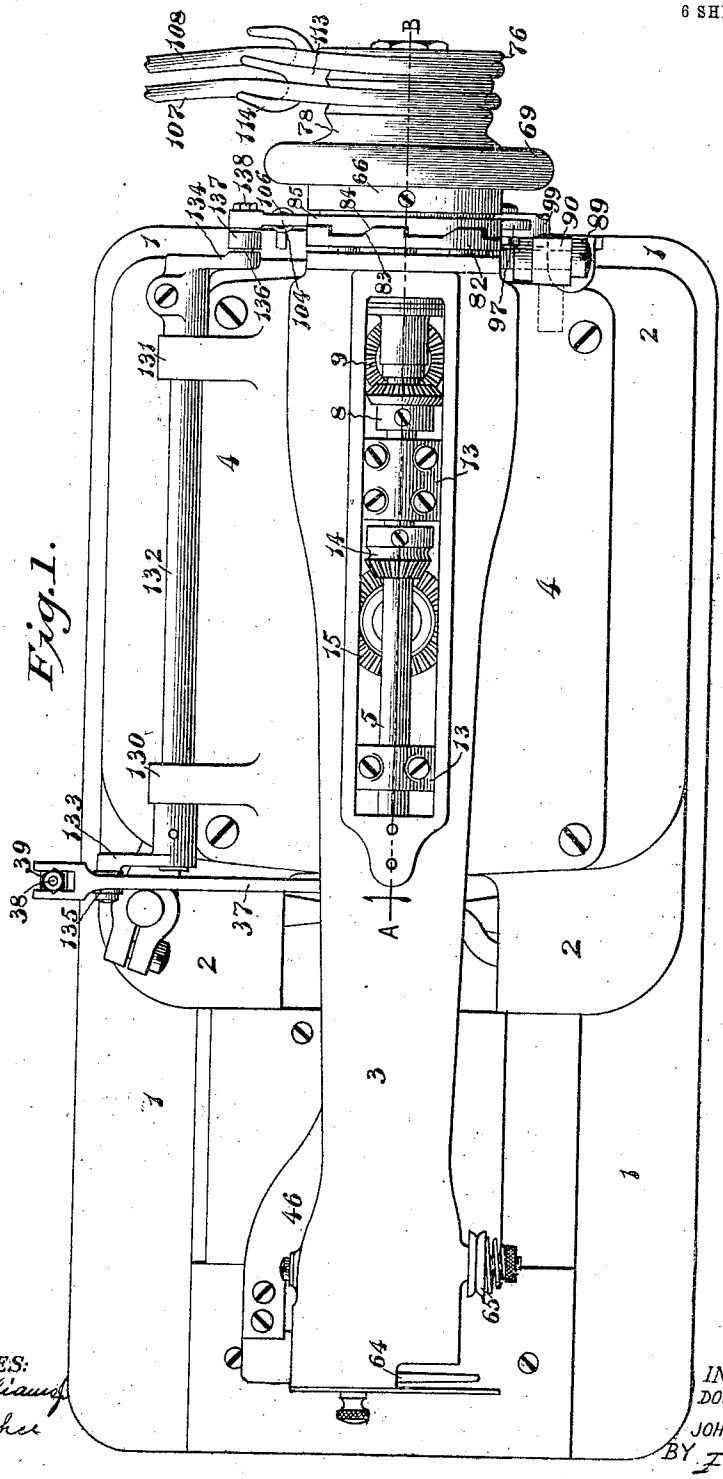

Fig. 1.

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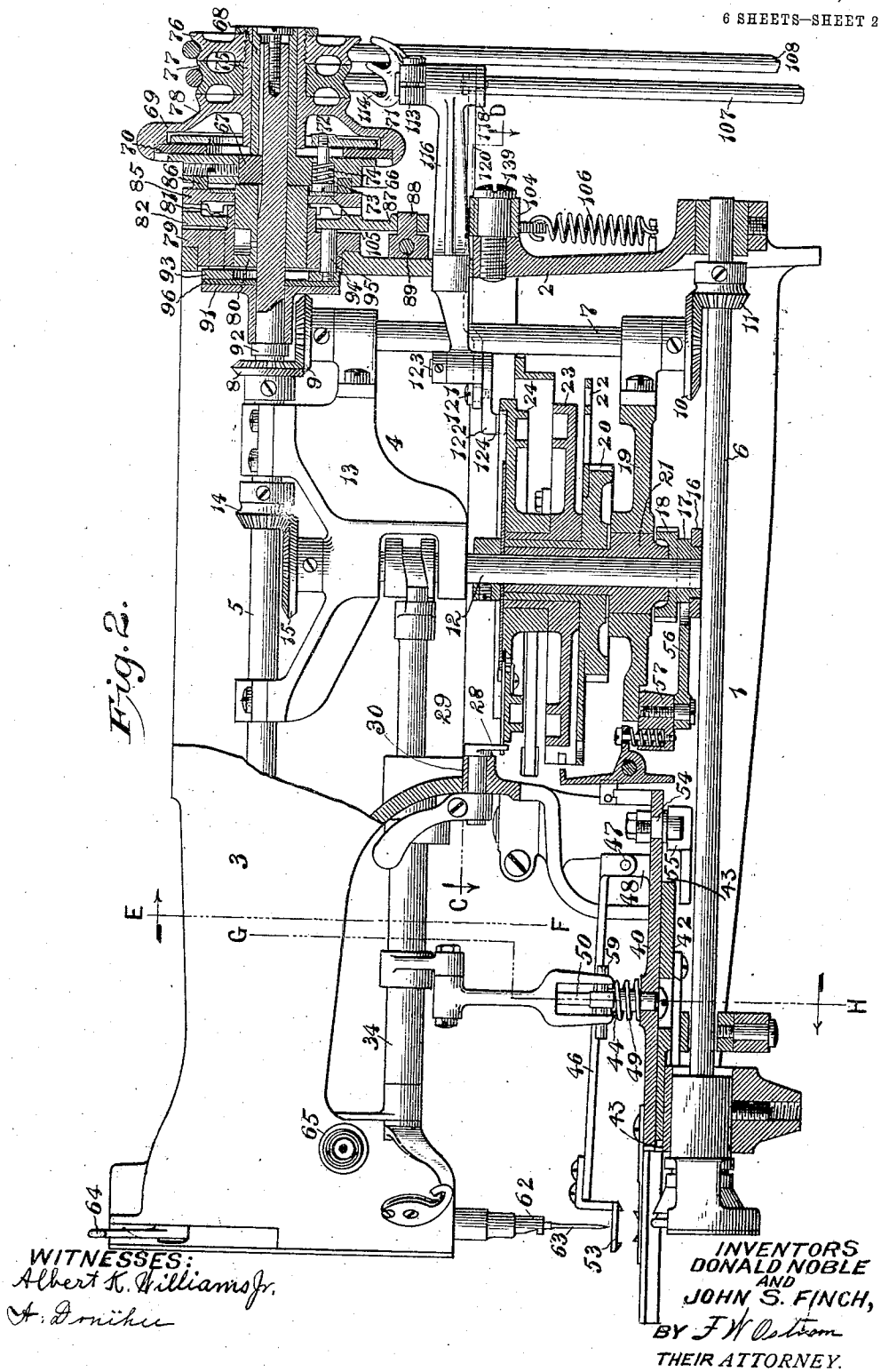

Fig. 2.

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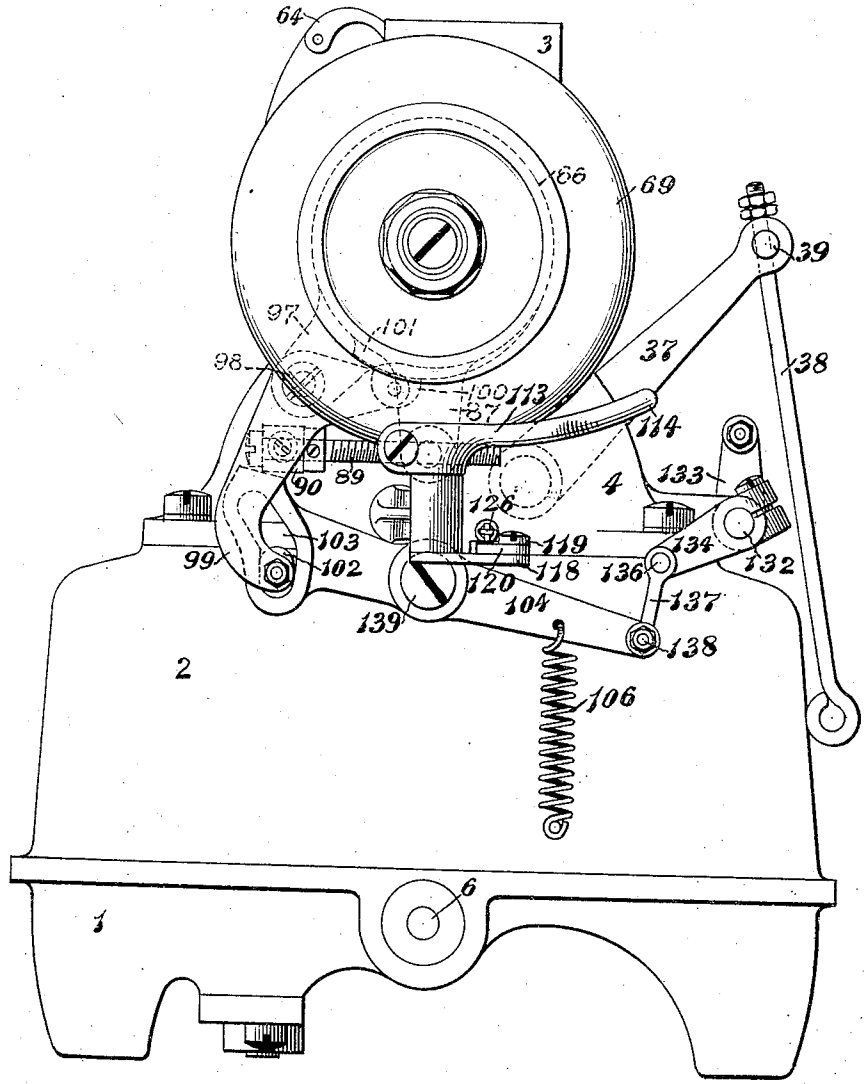
Fig. 3.



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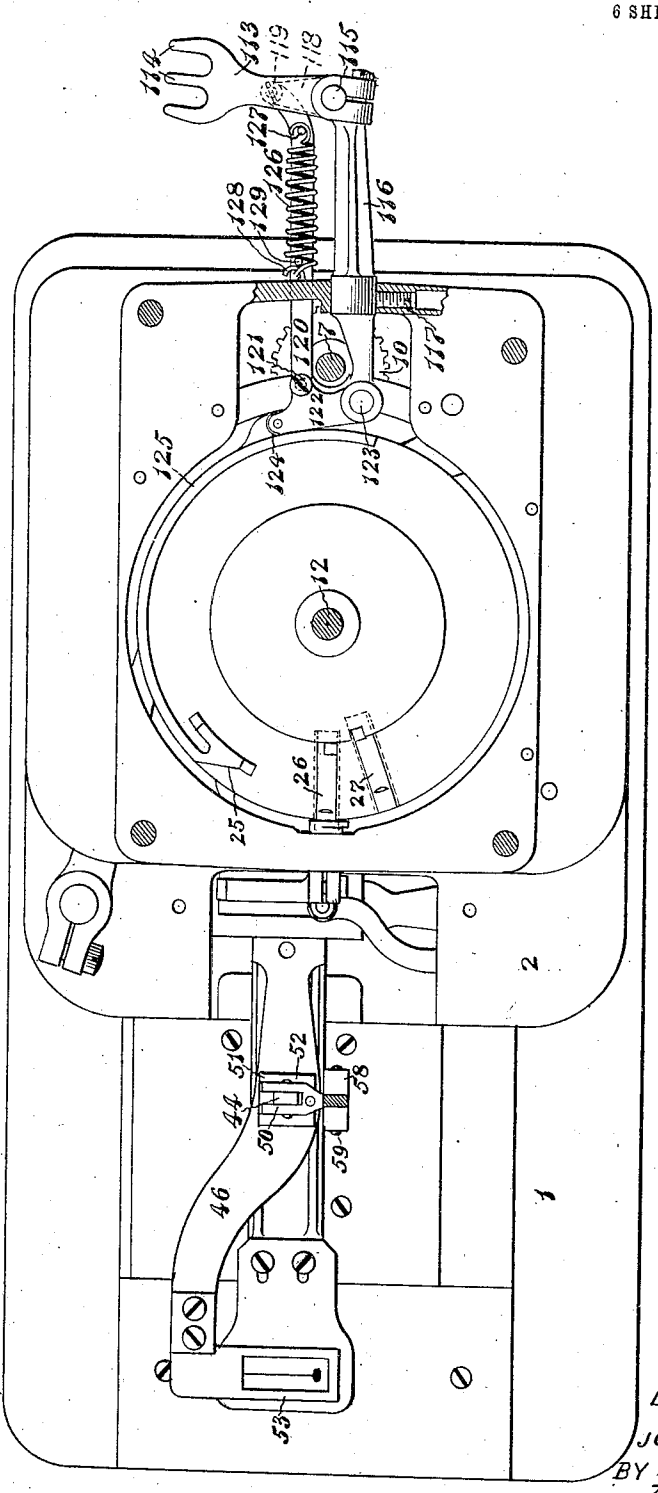

Fig. 4.

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6 SHEETS—SHEET 5.

Fig. 5.

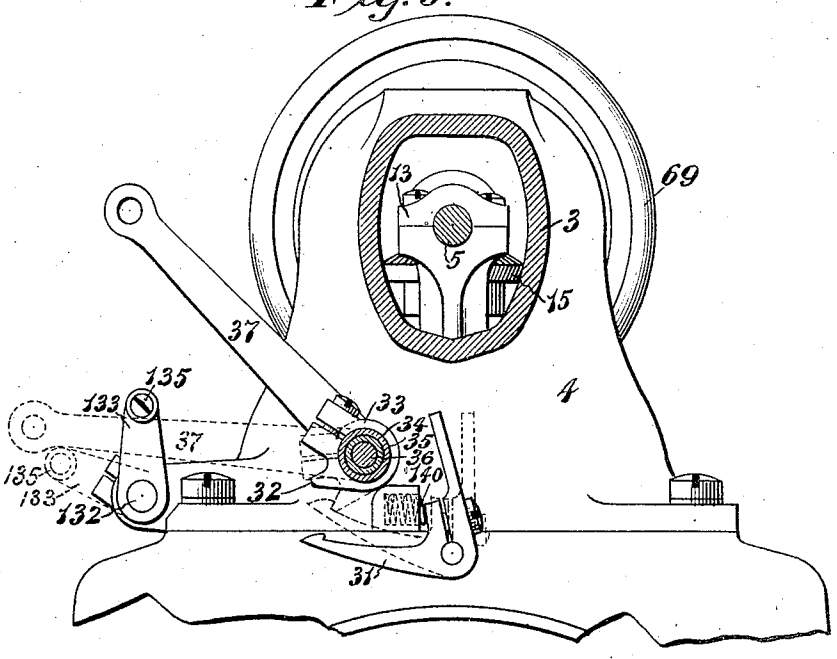
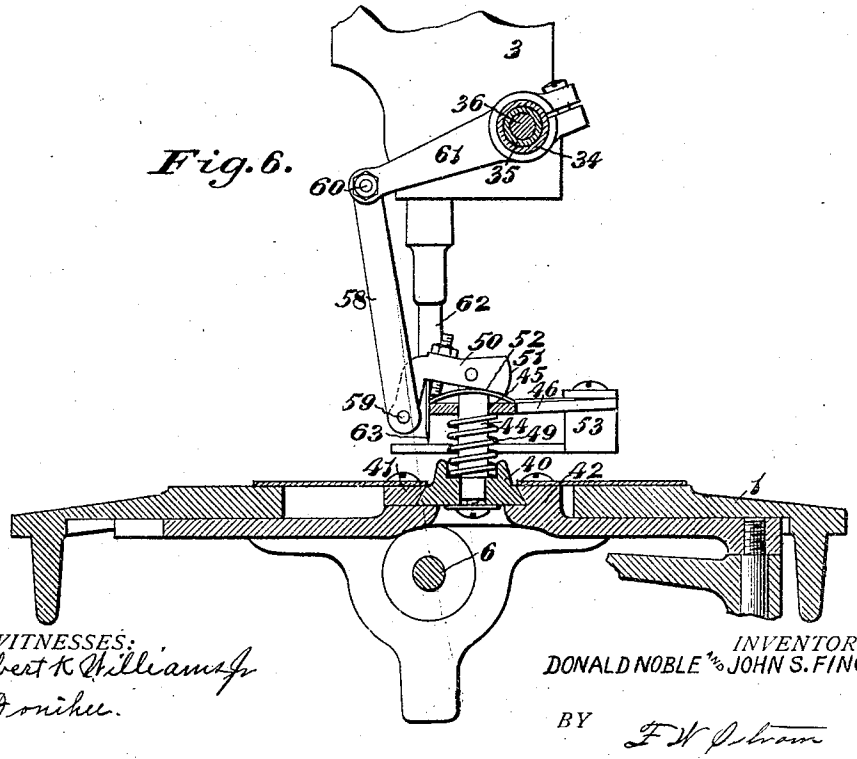


Fig. 6.



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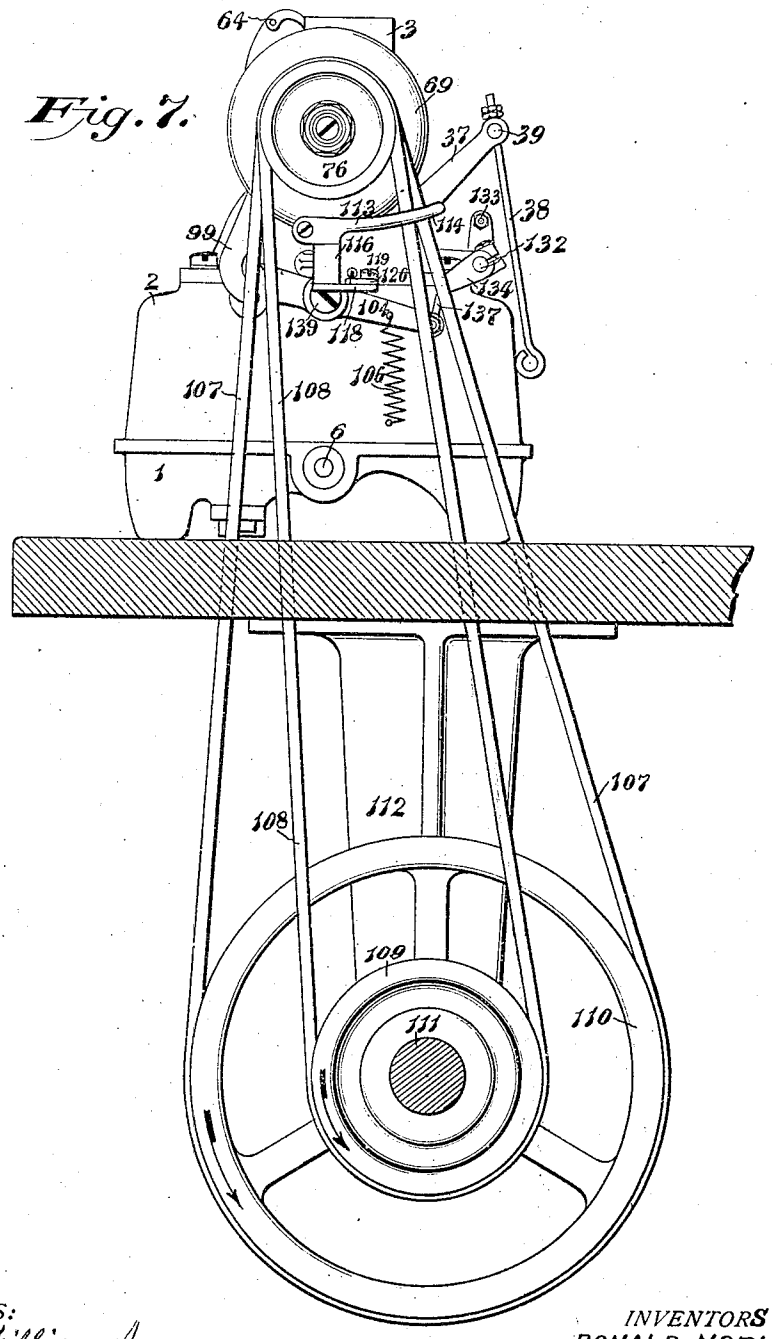
6 SHEETS—SHEET 6.

Fig. 7.



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STOP-MOTION MECHANISM FOR SEWING-MACHINES.

1,047,111. Specification of Letters Patent. Patented Dec. 10, 1912.

Application filed December 19, 1906. Serial No. 348,619.

To all whom it may concern:

Be it known that we, DONALD NOBLE, a subject of the King of Great Britain, and JOHN S. FINCH, a citizen of the United States, residents of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Stop-Motion Mechanisms for Sewing-Machines, of which the following is a specification.

This invention relates to improvements in stop-motion mechanisms, and one of its objects is to automatically slow the speed of a driven mechanism, preparatory to bringing into action the mechanism for arresting the action of such driven mechanism, by the employment of multiple belts driven at different speeds and coacting with a stop-motion pulley and a loose pulley, said stop-motion pulley being provided with multiple belt-driving surfaces, said belts being automatically controlled for positioning them relatively to the several belt-driving surfaces when adjusted to slow the speed of the machine.

Another object is to provide the shaft upon which the stop-motion pulley is mounted with opposing elements located on opposite sides of a mechanism which, when actuated to stop the machine, tends to force such opposing elements in opposite directions, thus relieving said shaft of end thrust when brought to rest by the action of the stopping mechanism, and when operatively connected with the source of power.

A further object is to improve such construction so as to better adapt it to the requirements of sewing machine productions.

In the accompanying drawings illustrating our invention, in the several figures of which like parts are similarly designated, Figure 1 is a plan view of a buttonhole sewing machine equipped with our invention. Fig. 2 is a front side sectional elevation on the line A—B, Fig. 1. Fig. 3 is a rear end elevation of Fig. 1. Fig. 4 is a plan view on the line C—D, Fig. 2. Fig. 5 is a view partially in section on the line E—F, Fig. 2. Fig. 6 is a view partially in section on the line G—H, Fig. 2. Fig. 7 is a rear end elevation, similar to Fig. 3, together with the main driving shaft (in section) upon which are secured pulleys of unlike diameters for transmitting to the actuating mechanism of the buttonhole sewing machine comparatively slow and fast speeds.

Our invention is herein shown and described as applied to a Wheeler & Wilson buttonhole sewing machine, but it is to be understood that it is equally applicable to machines for effecting the stitching or overseaming of a predetermined design or figure, such machines, for instance, as are used for sewing on buttons, working eyelets, staying seams and securing straps to under garments.

Many of the features of our present invention are similar in construction and operation to those of the device shown and described in U. S. Patent No. 656,853 issued to Donald Noble to which reference may be had, except that our present construction has been improved so as to better adapt it to the requirements of greater speed.

1 is the base of the sewing machine and 2 is its standard.

3 is the overhanging arm and 4 is its base.

5 is the main or needle-bar-actuating shaft and 6 is the loop-taker driving shaft, said shafts being operatively connected by an upright shaft 7 and bevel gears 8, 9 and 10, 11, the two latter being of the ratio of two to one, thus giving to the loop-taker two revolutions to one complete actuation of the needle-carrying bar.

12 is an upright shaft journaled in a bracket 13 and operatively connected with the needle-driving shaft 5 by gears 14 and 15 which are of the ratio of two to one, thus giving to the shaft 12 one revolution to two revolutions of the needle-bar-actuating shaft 5. To the lower end of the shaft 12 is secured a feed eccentric 16 and an overseaming eccentric 17 which, through suitable connections (not shown), transmit to the cloth-holding clamp its step by step feed movements in the direction of the length of the buttonhole, and the necessary vibratory movements for the placing of the side over-

seam and barring stitches. To the vertical shaft 12, directly above the eccentric 17, is secured a gear 18 which through suitable connections (not shown) transmits motion to the gear 20 which is mounted on a hub 21 secured in the bracket 19. Said gear 20 carries a cam-driving disk 22 which, at a predetermined time, transmits motion to the barring cam 23 to which is secured the controller cam 24, said cam being provided at its upper side with a belt-shifting cam 25 and tripping dog 26. The drawings illustrate a second dog 27 which is important to the control of the time at which the cutter for cutting the buttonhole slit shall be actuated but not essential to the herein described invention; accordingly, in the further description of our invention reference will be made only to the dog 26.

28 is a depending finger, the free end of which extends below and in line with the circular path of travel of the tripping dog 26. The depending finger 28 is secured upon the inner end of a short shaft 29 journaled in a suitable bearing 30 formed in the standard 2 of the base 1. Upon the other end of the shaft 29 is secured a spring-actuated pawl 31 which coacts with a tooth 32 carried by a clutch-collar 33, which latter is secured upon a tubular shaft 34 mounted upon a second tubular shaft 35 which, in turn, is mounted upon a rock-shaft 36.

37 is an operating lever fast upon the tubular shaft 34 and carrying at its outer end a rod 38 which slides freely through a pivot pin 39. The rod 38 at its lower end is attached to any suitable treadle connection (not shown) by which said rod may be operated to start the machine.

40 is the cloth-clamp slide mounted in dove-tail ways 41 formed on the feed-slide 42, said feed-slide being similarly mounted in dove-tail ways 43 secured to the underside of the base 1.

44 is a post rigidly secured to the cloth-clamp slide 40 and passes through a hole 45 in the upper hinged section 46 of the cloth-clamp, said hinged section being pivoted at 47 to a lug 48 formed upon the cloth-clamp slide 40. Interposed between the upper face of the slide 40 and the underside of the hinged section 46 of the cloth-clamp is a spring 49 by means of which said section 46 is raised above the material held in the cloth-clamp.

50 is a cloth-clamp-closing lever provided with a cam portion 51, which latter bears upon a half-elliptic spring 52 to hold the free end 53 of the hinged section 46 yieldingly down upon the material. The cloth-clamp slide 40 is operatively connected with the actuating mechanism of the sewing machine through suitable connections including the upright shaft 12, gear 18, hub 21, gear 20, cam-driving disk 22, barring cam 23, controller cam 24, slidable connection 54, and barring lever 55, which latter is operatively connected, through suitable connections (not shown), with the lever 56 which is pivoted at one end to the bracket 57 secured to the bracket or truss 19. The opposite end of the lever 56 is bifurcated to receive the eccentric 17 which gives to said lever its vibratory movements which, in turn, are transmitted to the cloth-clamp through the connections referred to.

58 is a link connected at its lower end to the cloth-clamp lever 50 by a pin 59, its opposite end being pivotally connected, by a pivot stud 60, to a lever 61 fast on the tubular rock-shaft 34.

62 is the needle-carrying bar, 63 the needle, 64 the needle-thread take-up and 65 is the needle-thread tension device.

The foregoing is descriptive of the cloth-clamp and so much of the cloth-clamp actuating mechanism as is deemed necessary for a proper understanding of the application of our invention, and comprises the same means and the same methods of operation as are fully illustrated and described in our pending United States application for improvements in buttonhole sewing machines, Serial No. 348,618, filed December 19, 1906, to which reference may be had for a more detailed description of the parts previously referred to and their functions.

It is to be understood that the controller cam 24, as in the buttonhole sewing machine application above referred to, is given one complete rotation during the overseaming of the sides and the barring of the opposite ends of the buttonhole, such rotation consisting of two semi-rotations, one for each barring operation.

66 is a cam disk rigidly secured upon the shaft 5 in any suitable manner, as by a key 67. Upon the hub 68 of the disk 66 is loosely mounted a stop-motion pulley 69 which is provided with an internal friction ring 70 secured fast to said pulley 69 between the disk 66 and a yielding disk 71, the latter being secured to said first mentioned disk 66 by screws 72 (preferably three in number). Interposed between the heads of the screws 72 and the bottoms of the pockets 73 (only one shown) formed in said disk 66, and surrounding said screw 72, are coil springs 74 which tend to draw said disks 66 and 71 together, thereby gripping the friction ring 70 between said disks, and frictionally securing the stop-motion pulley 69 and the disks 66 and 71 together. Secured tight on the end of the hub 75 of the stop-motion pulley 69 is a belt pulley 76, between which and said stop-motion pulley is journaled on said hub a loose pulley 77. 78 is a belt groove formed on the stop-mo-

tion pulley 69 adjacent to the pulley 77 and similar in cross-section to the belt groove formed in each of the pulleys 76 and 77.

79 is a bushing rigidly secured in the rear end of the arm base 4 and supporting the bushing 80 within which is journaled the shaft 5, said bushing 80 being held in place in any suitable manner, as by the usual set screw (not shown).

81 is a hub or ring formed on the bushing 79 concentric with the shaft 5 and bushing 80. Fitted around said hub 81 is a toothed disk 82, the inclined surfaces 83 of said teeth being adapted to match and coöperate with similar inclined surfaces 84 of complementary teeth formed on a brake disk 85, which latter is interposed between said disk 82 and the cam disk 66.

86 is a friction ring (preferably of leather) fast to the cam disk 66, against which ring the face of the disk 85 presses in the act of stopping the machine. The disk 82 is held against rotation by an arm 87 formed integral therewith, in the end of which arm is fitted a stud 88 through which passes transversely an adjusting screw 89. Said screw 89 is journaled after the manner of a swivel in the end of a post 90 secured in the arm base 4 in any suitable manner, and by turning said screw 89 the disk 82 may be adjusted axially around the hub 81 over which it is fitted.

91 is a resisting flange tight on the shaft 5 and hard against a shoulder 92 formed thereon.

93 is a brake ring supported in position by shouldered screws 94 tapped therein (preferably three in number) and which pass freely through the holes 95 in the bushing 79 and bear against the back of the disk 82. Interposed between the ring 93 and the flange 91 is a friction washer 96 (preferably made of leather).

Formed on the brake disk 85 is an ear 97 to which is pivoted at 98 the releasing lever 99. Said lever 99 is provided with an upper horizontally disposed arm projecting beneath the cam disk 66, which is provided with a shoe 100 adapted to engage a cam step 101 formed on the periphery of said disk 66.

The operation of the toothed disks 82 and 85 with respect to the cam disk 66 is precisely similar to the operation of the analogous parts shown and described in U. S. Patent No. 656,853, previously referred to; but since the efficiency of these parts has been greatly increased by our additional improvements we will, for the purpose of a clear understanding, describe such older features of construction in connection with the elements which we have added.

In running position, the block 102 occupies the upper portion of the cam slot 103 in the lever 104, with the shoe 100 withdrawn outside the path of rotation of the cam step 101. In such position there is no pressure in opposite directions between the disks 82 and 85, the latter being caused to back away from the cam disk 66 by the pressure of the springs 74 behind the heads of the screws 72, between which and said disk is interposed a hardened washer 105 to prevent undue wear. In released or running position the heads of the screws 72 project outwardly slightly beyond the surface of the friction ring 86, and in assembling these stop-motion parts the cam disk 66 is set in such position on the shaft 5 that when the toothed disks 82 and 85 are closed together, said cam disk 66 and flange 91 will turn unresisted, and at such time the internal friction ring 70 secured to the stop-motion pulley 69 will be firmly gripped between the disks 71 and 66 by the pressure of the springs 74.

When, however, the lever 104 is shifted by the spring 106 to position to stop the machine, as shown in Fig. 3, the shoe 100 on the upper side of the lever 99 will be brought within the path of rotation of the cam step 101 by the action of the cam slot 103 on the block 102, causing said cam step to strike said shoe 100 and tend to force it away, which action is resisted by the shape of the lower portion of the slot 103 in said lever 104. The cam step 101 being unable to force the shoe 100 away, thereby causes the lever 99 upon which said shoe is carried, together with the disk 85 to which said lever is fulcrumed, to be rotated for a short distance. During such slight rotation of the disk 85 the shoe 100 will slip partially up the gradual incline of said cam step 101.

The slight rotary action thus imparted to the disk 85 causes the latter and the disk 82 to be spread slightly apart, the complementary inclines 83, 84 of the teeth formed thereon effecting such spreading, as will be readily understood. As the disks 82, 85 are spread apart, the latter will be forced against the friction ring 86 on the rotary disk 66, and the former, through the screws 94, will force the brake ring 93 against the friction washer 96, squeezing the latter between said ring and the flange 91. Simultaneously with such action, the screws 72 will be compressed against the springs 74, thereby releasing the friction ring 70 carried by the stop-motion pulley 69 from being gripped between the disk 71 and cam disk 66, thus leaving said stop-motion pulley 69 free to revolve as the machine is brought to rest, which is effected by the friction supplied in forcing the disk 85 against the ring 86 and the non-rotatable ring 93 against the friction washer 96 and the action of the cam step 101 on the shoe 100.

It will be observed that the lateral pres-

sure supplied in forcing the brake members against the rotating members is exerted upon the same in opposite directions, and that, therefore, no end thrust is produced on the shaft, which is a very desirable condition. Also, by reason of the friction ring 70, carried by the stop-motion pulley 69, being gripped in opposite directions between two surfaces when actuated to drive the machine there is no end thrust of the shaft 5, which results in great economy of power.

During the operation of the machine, the stop-motion pulley 69 is driven at two different speeds, a comparatively fast speed being employed throughout the major portion of the operation, and a comparatively slow speed being used at the time that the stop-motion mechanism is automatically actuated to stop the machine, as at the completion of a buttonhole.

The different speeds are effected by two separate belts 107, 108 which run from driving pulleys 109, 110 secured upon the power shaft 111 mounted in suitable bearings in the hanger 112, the shaft 111 receiving motion from any suitable source of power. The belts engage at different times the belt-groove 78 on the stop-motion pulley 69 and the pulleys 76 and 77, as will be presently set forth.

113 is a belt shipper provided with a forked end 114 adapted to engage the belts 107, 108, said belt shipper being secured on the upper end of a short vertical rock-shaft 115, which latter is journaled in the outer end of a bracket 116 secured to the arm base 4 in any suitable manner, as by screw 117. Upon the lower end of the vertical shaft 115 is formed a crank-arm 118 to which is pivoted at 119 one end of a link 120. The other end of said link is pivoted at 121 to a lever 122 pivoted at 123 to the inner end of the bracket 116. Carried on the end of said lever 122 is a roll 124 adapted to be engaged by a guard-rail 125 formed upon the upper face of the cam 24.

126 is a coil spring, one end of which is attached to the link 120 at 127, while its other end is secured at 128 to the arm base 4, the tendency of said spring being to keep the roll 124 on the end of the lever 122 pressed in a direction to hold the belts in operative relationship with the groove 78 and loose pulley 77.

129 is a stop-pin, carried by the link 120, which at the inward limit of the movement of said link abuts against the arm base 4 and serves as a stop to limit the movements of the belt shipper toward the arm base 4.

The operation of the speed-changing mechanism is as follows: As previously alluded to, the machine is stopped on the slower of the two speeds, delivered by the belt 108, at which time said belt is in engagement with the tight pulley 76 and the high speed belt 107 is running upon the loose pulley 77. Soon after the machine is again started, the roll 124 will drop off from the end of the guard-rail 125 by the action of the spring 126, thereby causing the belt shifter 113 to be moved toward the left, which action shifts the high speed belt 107 off from the loose pulley 77 and into the groove 78. At the time that the slow speed belt 108 is shipped from the tight pulley 76 over onto the loose pulley 77, the cam 24 has entered upon the second half of its rotation. Soon after said cam 24 has started upon the second half of its rotation, the beveled end 25 of the cam guard-rail 125 will engage the roll 124 and cause the belt shifter 113 to be moved toward the right, which will cause the high speed belt 107 to be thrown out of the stop-motion pulley groove 78 and onto the loose pulley 77; and at the same time the slow speed belt 108 will be thrown off from the loose pulley 77 and onto the tight pulley 76, whereupon said belt 108 will act as a brake to reduce the velocity of the machine to a point equal to the speed at which said slow speed belt 108 is traveling.

Automatically reducing the speed of the machine preparatory to automatically stopping it is a highly important feature with respect to durability, not only of the stop-motion mechanism but the mechanism which it controls.

Journaled in bearings 130 and 131, formed on the lower portion of the arm base 4 at the rear side of the machine, is a rock-shaft 132 which has secured tight on one end the lever 133, while fast upon the other end is a lever 134. The lever 133 is provided at its free end with a roll 135 which coacts with the under edge of the lever 37, while the lever 134 is provided at its end with a stud 136, upon which latter is pivoted one end of a link 137, the other end of said link being pivoted around the stud 138 carried on one end of the lever 104 pivoted at 139 to the base standard 2.

The operation of our device is as follows: In the several figures the parts are shown in the position which they occupy when the machine is at rest. The machine is started by a movement of the lever 37 downwardly to the position shown in dotted lines, Fig. 5, which may be effected either by hand or through any suitable treadle connection with the rod 38 which, through its action upon the roller 135, causes the rock-shaft 132 to be rocked in a direction to move, through the connections 134 and 137, the lever 104 so as to bring the upper end of the slot 103 in contact with the block 102, thus carrying the shoe 100 out of the path of travel of the cam step 101 carried by the disk 66; and as soon as the controller

cam 24 has been rotated sufficiently to carry the tripping dog 26 out of contact with the depending finger 28 the spring 140 will cause the pawl 31 to engage the tooth 32, thus holding the lever 37 in the position shown in dotted lines, Fig. 5, until the dog 26 will in its rotation release the pawl 31 from engagement with the tooth 32. At the time that the rock-shaft 132 is rocked, by the action of the lever 37, to move the shoe 100 out of the range of travel of the cam step 101, the lever 99, through its connection with the ear 97 formed integral with the disk 82, and the action of the cam slot 103 upon the block 102 carried at the end of the lever 99, causes the toothed disks 82 and 85 to resume their normal or inactive positions relatively to the screws 72 and 94, thus releasing the ring 93 from the friction disk (leather) 96 and permitting the springs 74 to grip the friction ring (leather) 70 between the cam disk 66 and the disk 71, thus leaving the shaft 5 free to be driven by the stop-motion pulley 69.

As the dog 26 in its rotation again strikes the depending finger 28 and releases the latch 31 from engagement with the tooth 32, the spring 106, through its action upon the lever 104, causes the latter to be positioned as in Fig. 3, with the lower end of the slot 103 in contact with the block 102, thus causing the cam step 101 to act upon the shoe 100, through which action, as previously explained, the disks 82 and 85 are caused to be slightly separated, the disk 82, through its action upon the ends of the screws 94, forcing the ring 93 against the friction disk 96, thus arresting the action of the machine, and the disk 85, through its action upon the heads of the screws 72, at the same time forcing the disk 71 away from the friction ring 70, thus permitting the stop-motion pulley and parts carried by it to run free upon the shaft 5.

What we claim is:—

1. In a stop-motion mechanism, an expanding mechanism, a shaft, a stop-motion pulley mounted upon said shaft to run independently of or to drive said shaft, a resisting flange secured on said shaft, and a movable disk mounted concentrically to and rotatably with said shaft, said flange and disk arranged on opposite sides of said expanding mechanism, and automatic means for actuating said expanding mechanism to release said shaft from the driving control of said stop-motion pulley and act through the resisting flange to retard the motion of said shaft.

2. In a stop-motion mechanism, an expanding mechanism, a shaft, a stop-motion pulley mounted upon said shaft to run independently of or to drive said shaft, a resisting flange secured on said shaft, and a movable disk mounted concentrically to and rotatably with said shaft, said flange and disk arranged on opposite sides of said expanding mechanism, the latter being mounted concentrically to but independently of said shaft and automatic means for actuating said expanding mechanism to release said shaft from the driving control of said stop-motion pulley and act through the resisting flange to retard the motion of said shaft.

3. In a stop-motion mechanism, an expanding mechanism, a shaft, a stop-motion pulley mounted upon said shaft to run independently of or to drive said shaft, a resisting flange secured on said shaft, and a movable disk mounted concentrically to and rotatably with said shaft, said flange and disk arranged on opposite sides of said expanding mechanism, and automatic means for actuating said expanding mechanism to release said shaft from the driving control of said stop-motion pulley and act through the resisting flange to retard the motion of said shaft, in combination with multiple belts driven at different speeds for connecting said stop-motion pulley with the source of power.

4. In a stop-motion mechanism for sewing machines, a stop-motion pulley mounted on the main or driving shaft of the sewing machine to rotate independently of or synchronously with said shaft, a cam disk secured to said main or driving shaft, manually controlled means for operatively connecting said pulley and disk, means, including an expanding mechanism, for automatically discontinuing the operative relationship of said stop-motion pulley and said disk, and connections between said stop-motion pulley and the source of power including belts driven at different speeds, in combination with automatic means acting on said belts to reduce the speed of the machine before it is automatically brought to rest.

5. In a stop-motion mechanism for sewing machines, means for driving said mechanism including pulleys of unlike diameters, a stop-motion pulley mounted on the main or driving shaft of the sewing machine to rotate independently of or synchronously with said shaft, a cam disk secured to said main or driving shaft, means, including an expanding mechanism, for automatically discontinuing the operative relationship of said stop-motion pulley and said disk, in combination with belts for connecting said stop-motion pulley with said pulleys of unlike diameters, in combination with automatic means acting on said belts to reduce the speed of the machine before it is automatically brought to rest.

6. In a stop-motion mechanism for sewing machines, a stop-motion pulley mounted on the main or driving shaft of the sewing machine to rotate independently of or synchronously with said shaft, a cam disk se-

cured to said main or driving shaft, connections between said pulley and disk including a yieldingly mounted disk, means, including an expanding mechanism, for automatically discontinuing the operative relationship of said stop-motion pulley and said cam disk, and connections between said stop-motion pulley and the source of power including belts driven at different speeds, in combination with automatic means acting on said belts to reduce the speed of the machine before it is automatically brought to rest.

7. In a stop-motion mechanism, a main shaft upon which is mounted a stop-motion pulley capable of rotation with or independently of said shaft, said pulley being provided with multiple belt-driving surfaces, a loose pulley mounted to rotate upon the same axis as said stop-motion pulley, and a cam disk carrying a yielding disk secured upon said shaft and coacting with said stop-motion pulley to drive said shaft, in combination with belts driven at different speeds for connecting said stop-motion pulley and loose pulley with the source of power, in combination with automatic means acting on said belts to reduce the speed of the machine before it is automatically brought to rest.

8. In a stop-motion mechanism for sewing machines, a resisting flange and a cam disk secured to the main shaft of the sewing machine, a brake ring mounted independently of said shaft, a stop-motion pulley carrying a friction ring mounted upon said shaft and capable of being rotated with or independently of said shaft, and a yielding disk carried by said cam disk, in combination with oppositely arranged coacting disks provided with complemental teeth for forcing said yieldingly secured disk and brake ring in opposite directions.

9. In a stop-motion mechanism, a main shaft, a stop-motion pulley mounted to rotate with or independently of said shaft and provided with multiple belt-driving surfaces, a cam disk carrying a yielding disk secured upon said shaft and coacting with said pulley to transmit power, and automatic means for discontinuing the operative relationship of said pulley and disk, in combination with driving pulleys of unlike diameters operatively connected with the source of power and belts for transmitting power from said pulleys of unlike diameters to said stop-motion pulley.

10. In a stop-motion mechanism for sewing machines, means for driving said mechanism including pulleys of unlike diameters, a stop-motion pulley mounted on the main or driving shaft of the sewing machine to rotate independently of or synchronously with said shaft, a cam disk carrying a yielding disk secured to said main or driving shaft, and belts for connecting said stop motion pulley with said pulleys of unlike diameters, in combination with means including a cam and belt-shifting lever for automatically adjusting said belts to change the speed of said main or driving shaft of the sewing machine.

11. In a stop-motion mechanism, a main shaft, a stop-motion pulley mounted upon said shaft to rotate with or independently of said shaft, a cam disk secured upon said shaft, said pulley coacting with said cam disk to drive said shaft, oppositely arranged disks mounted concentrically to but independently of said shaft and provided with coacting complemental teeth, a flange and cam disk secured upon said shaft, a brake ring mounted concentrically to but independently of said shaft and coöperating with said flange to resist the cam action of the oppositely arranged toothed disks, and a releasing lever provided with a brake shoe which is adapted to coact with said cam disk to arrest the action of said main shaft.

12. In a stop-motion mechanism, a main shaft, a stop-motion pulley mounted upon said shaft to rotate with or independently of said shaft and provided with a friction ring, a cam disk secured upon said shaft and carrying a yieldingly-secured disk, said pulley and friction ring coacting with said cam disk and yieldingly-secured disk to drive said shaft, oppositely arranged disks mounted concentrically to but independently of said shaft and provided with coacting complemental teeth, a resisting flange secured upon said shaft, a brake ring mounted concentrically to but independently of said shaft and coöperating with said flange and cam disk to resist the action of the oppositely arranged toothed disks, and a releasing lever provided with a brake shoe which is adapted to coact with said cam disk to arrest the action of said main shaft.

13. In a stop-motion mechanism for sewing machines, a main shaft, a stop-motion pulley provided with a friction ring and mounted to rotate with or independently of said shaft, a resistance flange and a cam disk tight on said main shaft, a releasing lever, a tripping dog, and a yielding disk, the latter being provided with screws for securing it to said cam disk, said screws being provided with suitable springs for holding said yielding disk in contact with said friction ring, a brake ring provided with studs and adapted to coöperate with said flange, in combination with a toothed disk mounted concentrically to but independently of said main shaft and held against rotation, an opposing toothed disk mounted in like manner and operatively connected with said releasing lever provided at one end with a shoe and at its opposite end with a block, said block coacting with a cam slot formed

in one end of a cam lever, said cam lever being manually controlled to start the sewing machine in operation, and automatically controlled, by the action of said tripping dog, to cause said shoe to be brought into contact with said cam disk to arrest the action of said machine.

Signed at Bridgeport, in the county of Fairfield, and State of Connecticut, this 18th day of December, A. D. 1906.

DONALD NOBLE.
JOHN S. FINCH.

Witnesses:
A. K. WILLIAMS, Jr.,
W. G. MARKS.