March 24, 1942. S. B. BILGER 2,277,475

SEWING MACHINE

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Fig. 1.

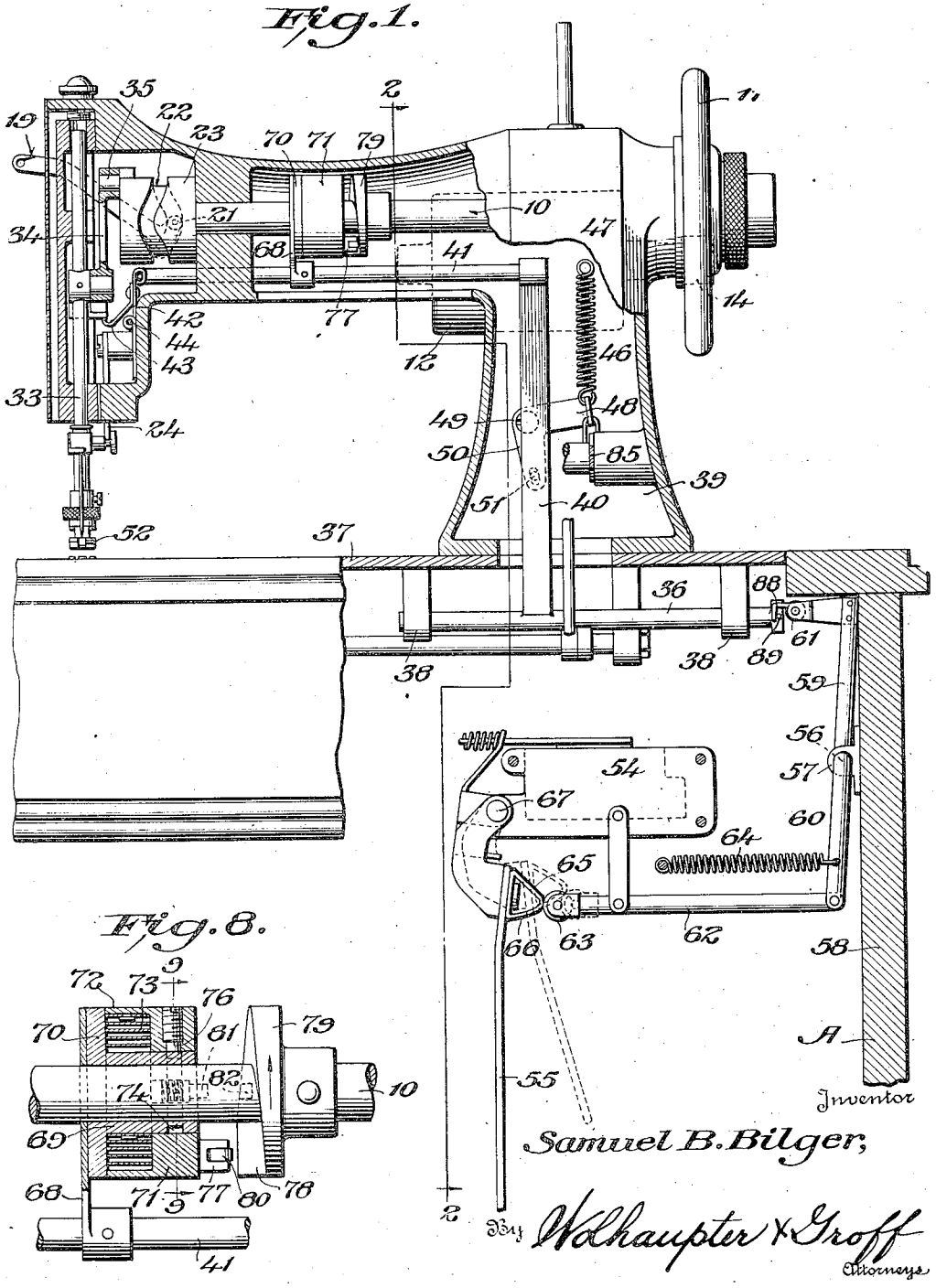


Fig. 8.

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SEWING MACHINE

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Fig. 2.

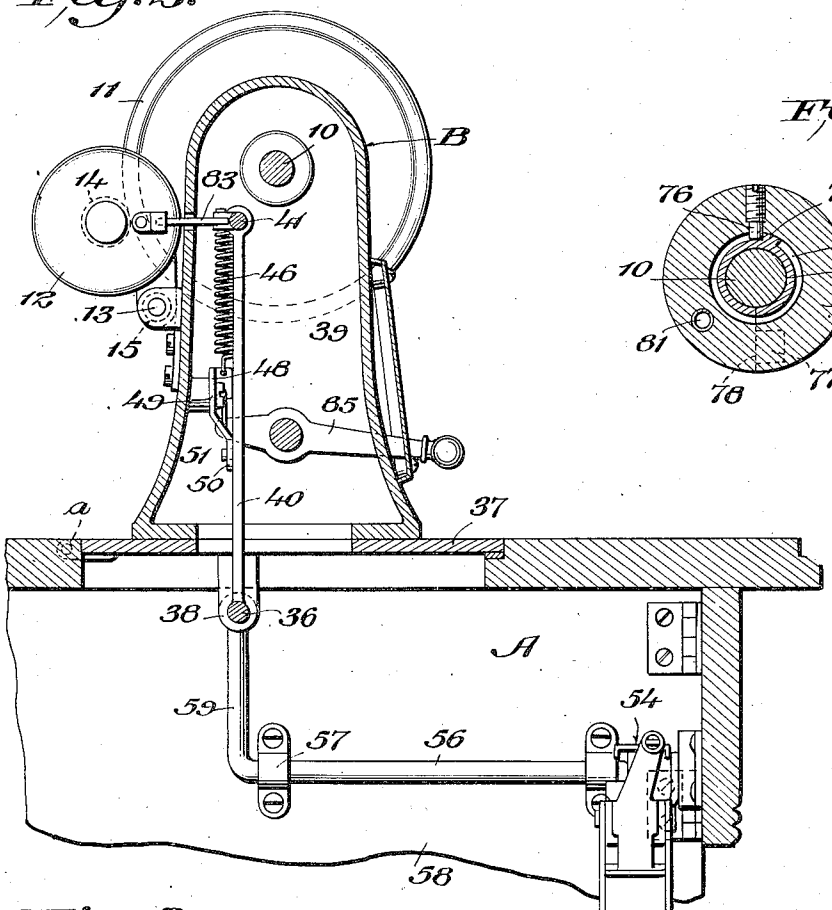


Fig. 9.

Fig. 3.

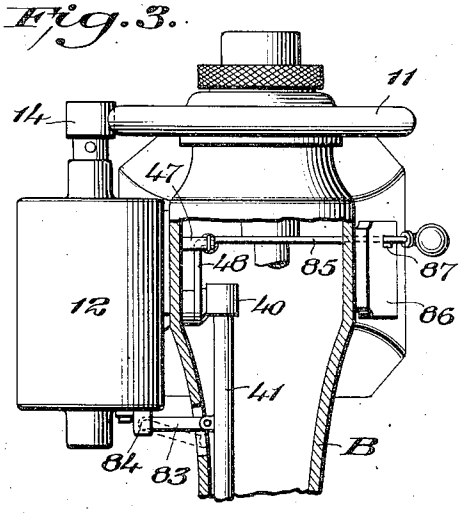
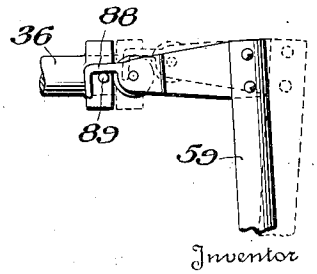


Fig. 10.



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Fig. 4.

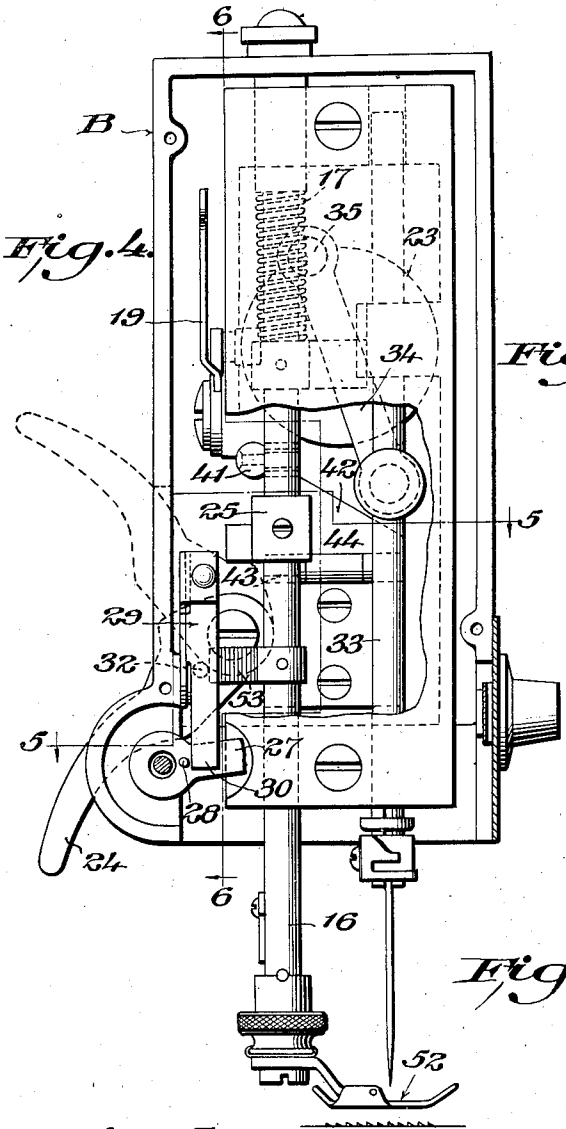


Fig. 6.

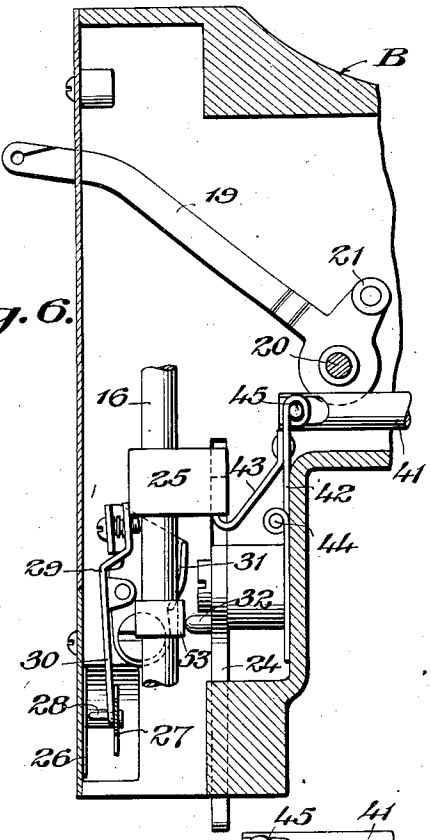


Fig. 7.

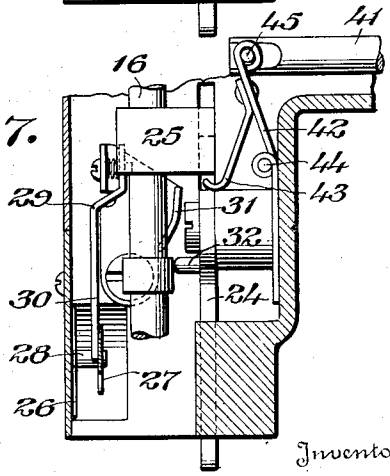
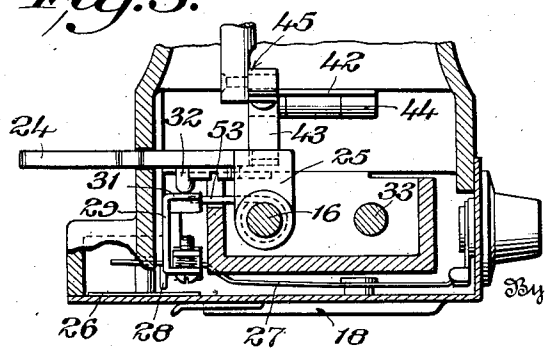


Fig. 5.



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Patented Mar. 24, 1942 2,277,475

UNITED STATES PATENT OFFICE

2,277,475

SEWING MACHINE

Samuel B. Bilger, Lancaster, Pa.

Application April 9, 1940, Serial No. 328,767

6 Claims. (Cl. 112—219)

This invention relates to sewing machines, and has for one of its principal objects to provide means to render automatic and fool-proof the operation of certain parts of sewing machines which heretofore have required manual operation, thus to enable sewing machines to be operated more rapidly than heretofore.

Another principal object of the invention is to provide a sewing machine embodying means to insure that, whenever the machine is stopped following any given period of operation thereof, the parts thereof will come to rest in positions to permit work to be freely removed from and applied to the machine without danger of damage to the work or breakage of the thread.

Another principal object of the invention is to provide simple, practical means for the purposes stated which may readily be embodied in various different sewing machines as at present constructed without material alterations to the machines.

With the foregoing and other objects in view, which will become more fully apparent as the nature of the invention is better understood, the same consists in the novel features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings and defined in the appended claims.

In the accompanying drawings, wherein like characters of reference denote corresponding parts in the different views:

Fig. 1 is a central, vertical section through a sewing machine including the features of the invention.

Fig. 2 is a transverse section taken approximately on the line 2—2 of Fig. 1.

Fig. 3 is a detail horizontal section showing the means for operatively connecting and disconnecting the motor with and from the machine.

Fig. 4 is an end elevation of the head of the machine with the cover plate and the thread tensioning device removed therefrom.

Fig. 5 is a horizontal section taken approximately on the line 5—5 of Fig. 4.

Fig. 6 is a vertical section taken approximately on the line 6—6 of Fig. 4 and showing the positions in which certain parts of the machine come to rest following any given period of operation of the machine.

Fig. 7 is a fragmentary view similar to Fig. 6 showing the positions taken by certain parts of the machine upon initiation of operation of the machine following any given period of rest thereof.

Fig. 8 is an enlarged longitudinal section through the spring device which insures that when the sewing machine stops the presser foot and the needle bar will be raised and the thread tensioning device will be released.

Fig. 9 is a transverse section on the line 9—9 of Fig. 8; and

Fig. 10 is a detail view illustrating by full and dotted lines the cooperation of certain parts of the mechanism.

In order to illustrate application of the mechanism comprising the invention to a sewing machine, there has arbitrarily been selected for this purpose a well known type of power driven, domestic sewing machine which derives its power from an electric motor under the control of a rheostat including a lever which is positioned for knee actuation by the operator of the machine. It is to be understood, however, that some or all of the features comprising the invention may readily be embodied in sewing machines of various other types, and that, therefore, the instant illustration of the mechanism as adapted to and incorporated in a sewing machine of the specific type mentioned is not to be construed as limiting.

The sewing machine illustrated is of the drop-head, cabinet type and comprises a cabinet or supporting structure designated generally as A and a drop-head designated generally as B, which is pivoted, as indicated at *a*, (Fig. 2) to the cabinet or supporting structure A for swinging movement between a raised or operative position, as shown in Figs. 1 and 2, and a lowered or stored position in which it is disposed within said cabinet or supporting structure below the top thereof in accordance with common and well known practice.

As usual, a main drive shaft 10 is journaled in the head B, a hand wheel 11 is provided on said shaft, an electric motor 12 is pivotally mounted on the head B as indicated at 13, a friction wheel 14 is provided on the armature shaft of said motor for cooperation with the periphery of the hand wheel 11, and suitable spring means 15 is provided to swing the motor 12 in a direction to cause its friction wheel 14 to engage the periphery of the hand wheel 11 whereby operation of the motor 12 is effective to drive the shaft 10.

The shaft 10 drives the various different movable operating parts of the sewing machine in known manner, but for the sake of clearness in illustrating the mechanism comprising the invention, various parts of the sewing machine with which the invention is not concerned have been omitted, only those parts with which the invention is specially concerned being shown.

Besides the shaft 10 and the motor 12, the principal parts of a sewing machine with which the invention is specially concerned are: (1) the presser foot shaft 16 which, as usual, is vertically disposed and mounted in the head B for vertical movement between lowered and raised, operative and inoperative positions, respectively, being urged constantly downward by a spring 17; (2) the thread tensioning device designated generally

as 18 (Fig. 5) which, by known means, is released or rendered inoperative when the presser foot shaft 16 is raised and is applied or rendered operative when the presser foot shaft is lowered; and (3) the thread take-up arm 19 which is pivoted to the head B as indicated at 20 and which has a roller 21 disposed in a cam groove 22 in a cam block 23 mounted on the drive shaft 10 whereby it is oscillated between raised and lowered positions in response to rotation of the shaft 10.

As usual, the head B has pivoted thereto a lever 24 for manual manipulation and for cooperation with a block 25 on the presser foot shaft 16 to raise said shaft to its inoperative position, to hold it raised and to release it for downward movement to its operative position by its spring 17. Also, as usual, the thread tensioning device 18 comprises a thread clamping disk 26 and a spring arm 27 having a pin 28 which, when said arm is released or is unrestrained (see Fig. 7), bears against said disk under the spring influence of said arm and thereby causes said disk to act to tension the thread. Further and also as usual, the means whereby the thread tensioning device 18 is released when the presser foot shaft 16 is raised, comprises a member 29 pivoted to the head B and including a finger 30 and a cam lip 31, the former of which cooperates with the spring arm 27 and the latter of which has cooperating therewith a pin 32 on the lever 24, the arrangement in this respect being such that when the lever 24 is raised to raise the presser foot shaft 16 the pin 32 cooperates with the cam lip 31 to swing the member 29 in a direction to cause its finger 30 to flex the spring arm 27 away from the disk 26 and thereby release tension on the thread, and when the lever 24 is lowered to lower the presser foot shaft, the member 29 is released and the spring arm 27 thereby is permitted to act through its pin 28 upon the disk 26 to tension the thread.

The usual vertical needle bar 33 is slidably mounted for vertical reciprocation in front of the presser foot shaft 16 and is connected by a link 34 to an eccentric pin 35 on the cam block 23 whereby it is reciprocated in response to rotation of the main drive shaft 10.

Referring now to the mechanism comprising the invention, 36 designates a bar which is mounted beneath the base 37 of the head B for longitudinal sliding movement in suitable bearing lugs 38 depending from said base and which is disposed horizontally and extends parallel or substantially parallel to the head B. Suitably fixed to and extending upwardly from this bar into the hollow pedestal 39 of the head B is an arm 40, while suitably fixed at its inner end to the upper end of said arm and extending horizontally through the head B below and parallel to the main drive shaft 10, is a rod 41 which, at its outer end, is operatively connected with a horizontally pivoted, swingable member 42 which carries a finger 43 having a free end portion underlying the block 25 on the presser foot shaft 16.

The member 42 is disposed inwardly of the presser foot shaft 16 and is pivoted at its lower end, as indicated at 44, to the head B for swinging movement toward and away from said presser foot shaft 16. Moreover, the finger 43 has its free end portion related to said member 42 and to the block 25 so that when said member 42 is swung outwardly or toward the presser foot shaft 16 a predetermined amount from a substantially vertically disposed position, the free end portion of said finger is lowered sufficiently to permit the presser foot shaft to assume its lowered operative position, and when said member 42 is swung inwardly or away from said presser foot shaft to a substantially vertically disposed position, the free end portion of the finger 43 is raised sufficiently to act by its engagement with the bottom of the block 25 to lift the presser foot shaft 16 to its raised or inoperative position.

The rod 41 is operatively connected to the member 42 as indicated at 45 at a point above the pivot 44 of said member. Accordingly, outward shifting movement of the rod 41 is effective to swing said member 42 in a direction to permit the presser foot shaft to move downwardly to its operative position, and inward shifting movement of said rod 41 is effective to swing said member 42 in a direction to raise the presser foot shaft to its inoperative position.

Any suitable stop means may be provided to cooperate with the bar 36, the rod 41 and the member 42 to limit pivotal movement of said member 42 between positions in which the presser foot shaft 16 is lowered and raised to its operative and inoperative positions, respectively, and spring means of any suitable type associated in any suitable manner with the bar 36, the arm 40, the rod 41 or the member 42, is provided to tend constantly to shift the bar 36 and the rod 41 to their limits of inward movement in which the member 42 is disposed vertically or substantially vertically and the finger 43 acts through the block 25 to hold the presser foot shaft 16 in its raised or inoperative position.

In the present instance the spring means referred to comprises a substantially vertically disposed tension coil spring 46 within the pedestal 39 of the head B, suitably anchored at its upper end, as indicated at 47, and connected at its lower end with a substantially horizontally disposed arm 48 of a bell-crank lever 49 pivoted to said pedestal 39 and having its other downwardly directed arm 50 operatively connected with the arm 40 as indicated at 51. Thus, the spring 46 tends constantly to swing the bell-crank lever 49 in a direction to shift the arm 40, the bar 36 and the rod 41 to their limits of inward movement in which the finger 43 is raised and holds the presser foot shaft 16 in its raised or inoperative position.

Normally, the lever 24 is not used, but preferably it is retained as a part of the sewing machine in order that the presser foot shaft 16, if desired, may be manually raised to and held in its elevated or inoperative position. Accordingly, if the lever 24 is retained, it will normally be disposed in its lowered position as illustrated by full lines in Fig. 4 so that it does not in any way affect the operation of the sewing machine or of the mechanism constituting the present invention.

Heretofore, it was necessary, following any given sewing operation, to manually actuate the lever 24 to elevate the presser foot shaft 16 and thereby lift the presser foot 52 to release the work, this operation of the lever 24 resulting in simultaneous release of the thread tensioning means 18 due to the cooperation of the pin 32 on said lever with the cam lip 31 of the member 29 and to the cooperation of the finger 30 of said member 29 with the spring arm 27 of the thread tensioning device. However, according to the present invention, at the beginning of any given period of operation of the sewing machine the rod 41 is shifted outwardly to a position to permit lowering of the presser foot shaft 16 to its operative position by its spring 17, and is held in

this position during the sewing operation, being released, however, when the sewing operation is completed. Upon release of said rod 41, the spring 46 acts immediately to return same to its normal position, thereby causing the member 42 to be swung to elevate the presser foot shaft 16. Thus, instead of the operator of the sewing machine being required to actuate the lever 24 to lift the presser foot upon completion of any given sewing operation, lifting of the presser foot is automatically effected by the spring 46 upon release of the bar 36 and the rod 41.

In order to provide for release of the thread tensioning means 18 upon elevation of the presser foot shaft 16 and independently of operation of the lever 24, the presser foot shaft is provided with a finger 53 which, in response to elevation of the presser foot shaft, engages the cam lip 31 and thereby swings the member 29 in a direction to cause its finger 33 to flex the spring arm 27 away from the thread clamping disk 26. In other words, the finger 53 serves the same purpose, in response to elevation of the presser foot shaft 16, as the pin 32 on the lever 24 serves in response to actuation of said lever to elevate the presser foot shaft. The finger 53 is, of course, positioned on the shaft 16 so that when said shaft is lowered the member 29 is released and the thread tensioning means thereby is rendered operative. Thus it is apparent that the thread tensioning means is released or rendered in operative simultaneously with lifting of the presser foot and is rendered operative simultaneously with lowering of the presser foot. Thus, too, it is apparent that the lever 24 is not essential and may be omitted. However, said lever 24 preferably is retained as aforesaid, so that the presser foot and the thread tensioning means may be manually operated if desired and so that the presser foot may be held raised regardless of operation of the mechanism comprising the invention.

The switch or rheostat controlling operation of the motor 12 is illustrated conventionally and is designated generally as 54, and includes, as usual, an actuator in the form of a pivoted knee-lever designated as 55. In accordance with known practice the lever 55 has a normal position in which the switch or rheostat 54 maintains the circuit of the motor 12 open, and to which said lever is returned whenever it is released following its actuation to close the motor circuit. In this connection and in accordance with the present invention, means is provided whereby swinging of the knee-lever 55 to close the motor circuit shifts the bar 36 and the rod 41 to release the presser foot shaft for movement by its spring 17 to its lowered or operative position, and whereby release of said knee-lever to open the motor circuit releases the bar 36 and the rod 41 for return by the spring 46 to positions in which the presser foot shaft is held raised or inoperative. Thus, simultaneously with application of power to the sewing machine, the presser foot is lowered to its operative position and the thread tensioning device 18 is rendered operative, while simultaneously with cutting off of power to the sewing machine, the presser foot is raised and the thread tensioning means is released.

The means whereby actuation of the knee-lever 55 actuates the bar 36 and the rod 41 in the manner stated, comprises a horizontally disposed, forwardly and rearwardly extending shaft 56 rotatably mounted in suitable bearings 57 secured, for example, to the inner face of one end wall 58 of the cabinet structure A and having upwardly and downwardly extending arms 59 and 60, respectively, the former of which is provided with a roller 61 or other suitable means disposed for cooperation with the inner end of the bar 36 when the drop-head B is in its raised or operative position, and the latter of which has extending inwardly therefrom a rod 62 equipped at its inner end with a roller 63 or other suitable means for cooperation with the knee-lever 55. A suitable spring 64 tends constantly to rotate the shaft 56 in a direction to swing the arm 59 outwardly or away from the adjacent end of the bar 36 and to swing the arm 60 inwardly or toward the knee-lever 55, and the arrangement in this respect is such that under normal conditions or when the sewing machine is not being operated, the roller 63 is maintained engaged with the knee-lever 55 and the roller 61 is maintained in a position permitting the bar 36 to assume, under the influence of the spring 46, its aforesaid position in which the presser foot shaft 16 is held in its raised or inoperation position. Thus, when the knee-lever 55 is actuated to close the motor circuit and start the machine, said lever acts through the rod 62 to swing the arm 60 outwardly and the arm 59 inwardly, with the result that the arm 59 pushes the bar 36 in a direction to release the presser foot shaft for movement to its lowered or operative position by its spring 17. On the other hand, when the knee-lever is released to open the motor circuit, the springs 46 and 64 act immediately to restore the parts to their normal positions with consequent elevation of the presser foot to its inoperative position and release of the thread tensioning means.

Only a small amount of movement of the knee-lever 55 is required to actuate the bar 36 to permit lowering of the presser foot to its operative position, whereas considerable additional movement of said lever may be required to obtain all different speeds of operation of the motor 12 and of the sewing machine. In this connection it is desirable that only an initial, small amount of movement of the knee-lever 55 from its normal position be required to permit lowering of the presser foot and that said lever shall thereafter be effective to hold the bar 36 in presser-foot released position regardless of any additional movement of said lever to control the speed of operation of the sewing machine. Accordingly, there preferably is provided on said knee-lever a projection 65 which is so shaped that in response to an initial, small amount of swinging movement of said knee-lever in a direction to close the motor circuit, it cooperates with the roller 63 to swing the arms 59 and 60 to shift the bar 36 and the rod 41 to release the presser foot shaft for movement to its lowered, operative position, and thereafter rides over said roller and, while continuing to cooperate therewith to maintain the bar 36 and the rod 41 shifted to presser foot shaft released positions, is freely movable to actuate the rheostat 54 to vary the speed of operation of the motor 12. In short, the projection 65 has a face 66 which is concentric to the pivot 67 of the knee-lever 55 and which engages the roller 63 following pushing of said roller by said projection to a position in which the presser foot shaft is released (see the dotted line illustration in Fig. 1).

In order to permit free removal of a piece of work from a sewing machine following any given stitching operation and without danger of damage to the work or breakage of the thread, it

not only is necessary that the presser foot and the needle bar be raised and that the thread tensioning means be released, but that the thread take-up arm 19 be raised to permit free withdrawal of a portion of the thread. Heretofore, unless a sewing machine happened by chance to stop in a position with the thread take-up arm and the needle bar raised, it was necessary to grasp the hand-wheel of the machine and to manually rotate same to raise the thread take-up arm and the needle bar. However, the present invention includes means to insure stopping of the sewing machine in a position with the thread take-up arm and the needle bar raised and thus eliminates any necessity of the manual operation heretofore required to accomplish this purpose. In this connection and according to the invention, there is mounted upon the rod 41 an arm 68 carrying a hub member 69 through which the main drive shaft 10 loosely extends whereby it is freely rotatable relative to said hub member and whereby said hub member is freely movable longitudinally along said shaft. At its outer end said hub member is provided with an annular flange 70, while rotatably mounted on the inner end portion of said hub member is a drum 71 having an outwardly extending annular flange 72 which cooperates with the flange 70 to provide a chamber in which is disposed a helical spring 73, one end of which is fastened to said hub member 69 and the other end of which is fastened to said drum 71. In the hub member 69 is a channel 74 which extends almost entirely around said hub member but which is interrupted by a stop formation 75, while carried by the drum 71 and extending into said channel 74 is a pin 76. The drum thus is held against longitudinal movement relative to the hub member and its permissible amount of rotary movement relative to said hub member is limited to slightly less than a single, complete revolution by the cooperation of the pin 76 with the stop formation 75. The hub member 69 is held against rotation because of its connection with the rod 41 by the arm 68, and normally the spring 73 is wound or tensioned a suitable amount and reacts from said hub member to tend constantly to rotate the drum 71 in a direction counter to the normal direction of rotation of the shaft 10 and to the limit of rotation of said drum in said direction as determined by engagement of the pin 76 with the stop formation 75.

Extending inwardly from the inner end of the drum 71 is a lug 77 for cooperation with a spiral cam face, including an abrupt radial or substantially radial shoulder 78, on the adjacent end of a disk 79 which is fixed to the main drive shaft 10 for rotation therewith. The assembly comprising the hub member 69 and the drum 71 is, of course, shiftable with the rod 41, and when said rod is shifted outwardly to permit lowering of the presser foot 52 the said assembly is shifted to a position as shown in Fig. 8 of the drawings in which the lug 77 is disposed out of the path of rotation of the cam face and shoulder of the cam disk 79. Accordingly, when the rod 41 is in its outwardly shifted position, the main drive shaft 10 is free to rotate to operate the sewing machine without affecting the assembly comprising the hub member 69 and the drum 71. When, however, the rod 41 is shifted inwardly to raise the presser foot 52, the lug 77 is brought into the path of rotation of the cam face and shoulder of the cam disk 79. The shoulder 78 faces in the direction of rotation of the shaft 10 and accordingly is effective, upon inward movement of the drum 71, to pick up the lug 77 and through said lug to impart rotation to said drum in the same direction as said shaft. Preferably, the lug 77 is provided with a small roller 80 for anti-friction cooperation with the spiral face of the cam disk 79. However, the roller 80 is not essential and may be omitted. Similarly, a spiral face on the cam disk is not essential and may be omitted. Preferably, however, said spiral face is provided to ease the drum 71 inwardly rather than to permit it to move suddenly inwardly with a hammer action under the influence of the spring 46.

Power is cut off from the machine simultaneously with inward movement of the rod 41 and the drum 71, but when the power is cut off the movable parts of the machine do not immediately come to a state of rest. On the contrary, they continue to move due to their momentum. Thus, when the power is cut off, the drum 71 is coupled with the shaft 10 by engagement of the shoulder 78 with the lug 77 and the momentum of said shaft and of the movable parts connected thereto results in the drum 71 being rotated with said shaft, thereby adding winding or tension to the spring 73. If the machine has considerable momentum the drum may be rotated until the pin 76 engages the side of the stop formation 75 opposite the side which it normally engages, whereupon the machine will be brought to a positve stop. If, on the other hand, the machine has only a minor amount of momentum it may stop before the pin 76 engages the said opposite side of the stop formation 75. In any event, the spring 73 then will act to return the drum 71 to its normal position with the pin 76 disposed against the first mentioned side of the stop formation 75, and in doing so will, of course, impart reverse rotation to the shaft 10. In this connection it is pointed out that the angular disposition of the cam disk relative to the shaft 10 is such that when the shoulder 78 of said cam disk is engaged with the lug 77 and the drum 71 is in its normal position, the position of rotation of the shaft 10 is such that the thread take-up lever 19 and the needle bar 33 are raised. Accordingly, whenever power to the machine is cut off, the momentum of the machine abnormally tensions the spring 73 and said spring, by its return to normal tension, brings the shaft 10 to a position of rotation with the thread take-up arm and the needle bar raised.

To insure against the spring 73 reversely rotating the shaft 10 beyond a position in which the thread take-up lever and the needle bar are raised, the drum 71 is provided with a pin 81 which enters a recess 82 in the cam disk 79 when the shoulder 78 contacts with the lug 77. Thus, said pin 81 acts to stop reverse rotation of the shaft 10 by the spring 73 at the instant the drum 71 is returned to its normal position by said spring 73. The pin 81 is depressible and is yieldably urged outwardly relative to the drum 71 so that it is depressed by the spiral face of the cam disk 79 during rotation of said disk relative to the drum 71 and as a result of movement of said drum toward said cam disk, and then snaps into the recess 82 at the instant the shoulder 78 engages the lug 77.

In order to avoid the necessity of providing a very strong spring 73 for the purpose stated, it is desirable to provide means to operatively disconnect the motor 12 from the swing machine simultaneously with inward movement of the rod

41 to elevate the presser foot so that the spring 73 will not be required to operate the motor as well as the main drive shaft 10. Also, it is desirable to operatively disconnect the motor 12 from the sewing machine upon movement of the rod 41 to elevate the presser foot in order to secure fullest advantage of the momentum of the movable parts of the sewing machine in additionally winding or energizing the spring 73 following cutting-off of power to the machine. Accordingly, means is provided whereby inward movement of the rod 41 to elevate the presser foot swings the motor 12 to disengage its friction wheel 14 from the hand-wheel 11. This means comprises simply a strut 83 pivoted at its inner end to the rod 41 and suitably engaged at its outer end with the motor 12, as, for example, in a socket member 84 carried by the motor. The strut 83 is of a length such that when the rod 41 is shifted inwardly to lift the presser foot said strut approaches a position at right angles to said rod 41 and thereby swings the motor 12 outwardly sufficiently to disengage its friction wheel 14 from the hand-wheel 11, and when said rod 41 is shifted outwardly to release the presser foot said strut 83 assumes an angular position relative to the rod 41 permitting the motor to swing inwardly under the influence of the spring 15.

From the foregoing it will be apparent that when the sewing machine is at rest the presser foot is raised, the thread tensioning device 18 is released, the thread take-up arm 19 is raised, the motor 12 is operatively disconnected from the sewing machine and the needle bar 33 is raised due to being connected with the cam block 23 in the usual manner to be raised when said thread take-up arm is raised. It will be equally apparent that upon movement of the knee-lever 55 to initiate operation of the machine, the motor 12 will be started and will be released to be swung by the spring 15 into driving relationship to the sewing machine, the drum 69 will be shifted to disengage its lug 77 from the shoulder 78, the presser foot will be released to be moved to its lowered or operative position by the spring 17, and the thread tensioning device 18 will be rendered operative. Further, it will be apparent that following any given period of operation of the sewing machine and upon release of the knee-lever 55, the circuit of the motor 12 will be opened, said motor will be operatively disconnected from the machine, the presser foot 52 will be raised, the thread tensioning device will be released and the machine will be brought to rest with the thread take-up arm 19 and the needle bar raised in the manner previously described. Thus, the mechanism comprising the invention obviously provides for accomplishing automatically various operations which heretofore necessitated manual performance at the loss of valuable time and, at the same time, renders the machine fool-proof in respect to the performance of said operations.

While not essential, means preferably is provided to render the mechanism constituting the invention inoperative so that the sewing machine may be operated, if desired, in the heretofore known manner. For accomplishing this purpose any suitable means may be provided for moving the bar 36 and the rod 41 to, and holding them in, presser foot releasing positions. In the present instance the means for this purpose comprises a lever 85 pivoted intermediate its ends and connected at one end to the arm 48 of the bell-crank lever 49 so that it is swingable to shift the bar 36 and the rod 41 to presser-foot releasing positions. The other end of said lever extends through a slot in a cover plate 86 carried by the pedestal and said slot includes an offset portion or notch 87 into which the second mentioned end portion of said lever may be engaged to hold said bar and rod in presser-foot releasing positions.

In some instances the machine may be operating very slowly when the power thereto is cut off, and in that event the movable parts of the machine may not have sufficient momentum to cause the described momentum-responsive means to bring the machine to a state of rest with the thread take-up arm and the needle bar raised. Accordingly, means is provided to insure against cutting off of power to the machine until the rod 41 has reached substantially its limit of inward movement, by which time the shoulder 78 will have contacted the lug 77 and will have imparted at least slight rotation to the drum 71 even though the speed of operation of the machine may be quite slow. This means comprises a hook 88 carried by the arm 59 and cooperating with a pin 89 on the adjacent end of the bar 36, said hook and pin acting to hold the knee-lever 55 against movement to a position to open the motor circuit until the bar 36 and, consequently, the rod 41 have reached practically their limits of inward shifting movement, by which time, as aforesaid, the shoulder 78 has engaged the lug 77 and the drum 71 has had at least a small amount of rotation imparted thereto. The hook 88 opens downwardly so as not to interfere with downward swinging movement of the drop-head B from its raised or operative position to its lowered or stored position and so that the pin 89 becomes operatively engaged therewith upon upward swinging movement of the drop-head from its lowered or stored position to its raised or operative position. Any suitable means may be provided to permit the drop-head B to be swung between raised and lowered positions and to support the same in its raised position. In this connection and by way of example, the front portion A' of the cabinet structure A is illustrated in Fig. 4 as being hinged to the end wall 58 of said cabinet structure for inward and outward swinging movement and as including a top wall portion *a'* the inner edge portion of which underlies the outer edge portion of the base 37 of the drop-head B when said drop-head is in its raised position and said cabinet portion A' is in its inwardly swung position, thereby supporting said drop-head in its raised position. When the portion A' is swung outwardly the drop-head B is released to swing downwardly to its lowered position, after which the said portion A' may be returned to its inwardly swung position. On the other hand, when it is desired to raise the drop-head and support same in its raised position, the cabinet portion A' first is swung outwardly, the drop-head B then is swung upwardly to its raised position, and the cabinet portion A' then is returned to its inwardly swung position in which the inner edge of its top portion *a'* underlies the front edge of the base 37 of the drop-head.

Without further description it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art, and it will, of course, be understood that changes in the form, proportion and minor details of construction may be resorted to, without depart-

ing from the spirit of the invention and scope of the appended claims.

I claim:

1. In a sewing machine, a head, a presser foot mounted in said head for movement between raised and lowered positions, spring means tending constantly to lower said presser foot, a pivoted finger operable by swinging movement in one direction to raise said presser foot and by swinging movement in an opposite direction to release said presser foot for lowering by its spring means, a motor for operating the machine, a lever-operated switch for opening and closing the circuit of said motor, and means operable in response to motor-circuit-opening actuation of said switch lever to swing said finger to raise said presser foot and in response to motor circuit closing actuation of said switch lever to swing said finger to release said presser foot for lowering by its spring means.

2. In a sewing machine, a supporting structure, a drop-head mounted on said supporting structure for movement between raised and lowered operative and inoperative positions, respectively, a motor for driving the machine, a lever-operated switch carried by the supporting structure for opening and closing the circuit of said motor, said machine including a presser foot vertically movable between raised and lowered positions, spring means tending constantly to effect lowering of said presser foot, means carried by the drop head for raising the presser foot and holding the same raised and for releasing same for movement to its lowered position by said spring means, and means whereby raising of the drop-head to its operative position establishes an operative connection between the switch lever and said first named means so that said first named means is operable in response to motor-circuit-opening actuation of said switch lever to raise said presser foot and hold same raised and in response to motor-circuit-closing actuation of said switch lever to release said presser foot for movement to its lowered position by said spring means.

3. In a sewing machine, a supporting structure, a drop-head mounted on said supporting structure for movement between raised and lowered operative and inoperative positions, respectively, a motor for driving the machine, a lever-operated switch carried by the supporting structure for opening and closing the circuit of said motor, a vertically reciprocable needle bar carried by said drop-head, means operable in response to the momentum of the moving parts of the machine following cutting-off of power thereto to bring the needle bar to rest in a raised position, and means whereby raising of the drop-head to its operative position establishes an operative connection between the switch lever and said momentum responsive means so that the latter is rendered inoperative in response to motor-circuit-closing actuation of said switch lever and is rendered operative in response to motor-circuit-opening actuation of said switch lever.

4. In a sewing machine, a head, a drive shaft journaled in said head, power means for rotating said shaft, switch means controlling said power means, a vertically reciprocable needle bar carried by said head and operatively connected with said shaft for reciprocation by rotation of the latter, a non-rotatable hub member on said shaft with respect to which said shaft is rotatable, a drum mounted on said hub member for limited rotation with respect thereto, clutch means for coupling said drum to and for uncoupling the same from said shaft means whereby actuation of said switch means to initiate operation of said power means actuates said clutch means to uncouple said drum from said shaft and whereby actuation of said switch means to cut off power to said shaft actuates, said clutch means to couple said drum to said shaft for rotation therewith relative to said hub member by the momentum of said shaft and the moving parts of the machine, a spring connecting said drum with said hub member to be energized by momentum rotation of said shaft and drum following actuation of said switch means to cut off power to said shaft and accompanying coupling of said drum to said shaft and effective upon completion of momentum-rotation of said shaft to rotate said shaft counter to its normal direction of rotation until said drum reaches its limit of rotative movement relative to said hub member, the clutch means for coupling said drum to said shaft having a relationship to said needle bar such that when said drum and shaft are rotated by said spring to the limit of rotation of said drum relative to said hub member the position of said shaft is such that the needle bar is raised.

5. In a sewing machine, a head, a drive shaft journaled in said head, a motor for rotating said shaft, a vertically reciprocable needle bar carried by said head and operatively connected with said shaft for reciprocation by rotation of the latter, a non-rotatable hub member mounted on said shaft for movement therealong and with respect to which said shaft is rotatable, a drum mounted on said hub member for limited rotation with respect thereto, means whereby movement of said hub member and drum in one direction along said shaft couples said drum to said shaft for rotation therewith and in the opposite direction uncouples said drum from said shaft, a lever-operated switch for opening and closing the circuit of said motor, an operative connection between said switch lever and said hub member whereby the latter is shifted along said shaft to couple the latter with said drum in response to motor-circuit-opening actuation of said lever and whereby said hub member is shifted along said shaft to uncouple said drum from said shaft in response to motor-circuit-closing actuation of said lever, a spring connecting said drum with said hub member to be energized by momentum-rotation of said shaft and drum following motor-circuit-opening actuation of said lever and effective upon completion of momentum-rotation of said shaft to rotate said shaft counter to its normal direction of rotation until said drum reaches its limit of rotative movement relative to said hub member, the means for coupling said drum to said shaft having a relationship to said needle bar such that when said drum and shaft are rotated by said spring to the limit of rotation of said drum relative to said hub member the position of said shaft is such that the needle bar is raised.

6. A sewing machine as set forth in claim 5 including a connection between the switch lever and the motor whereby the motor is operatively disconnected from the drive shaft in response to actuation of the switch lever to open the motor circuit and to operate said clutch means to couple the drum with said drive shaft.

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