

No. 875,613.

W. N. PARKES.

PATENTED DEC. 31, 1907.

BOBBIN CONTROLLING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED APR. 27, 1903.

2 SHEETS—SHEET 1.

Fig. 1.

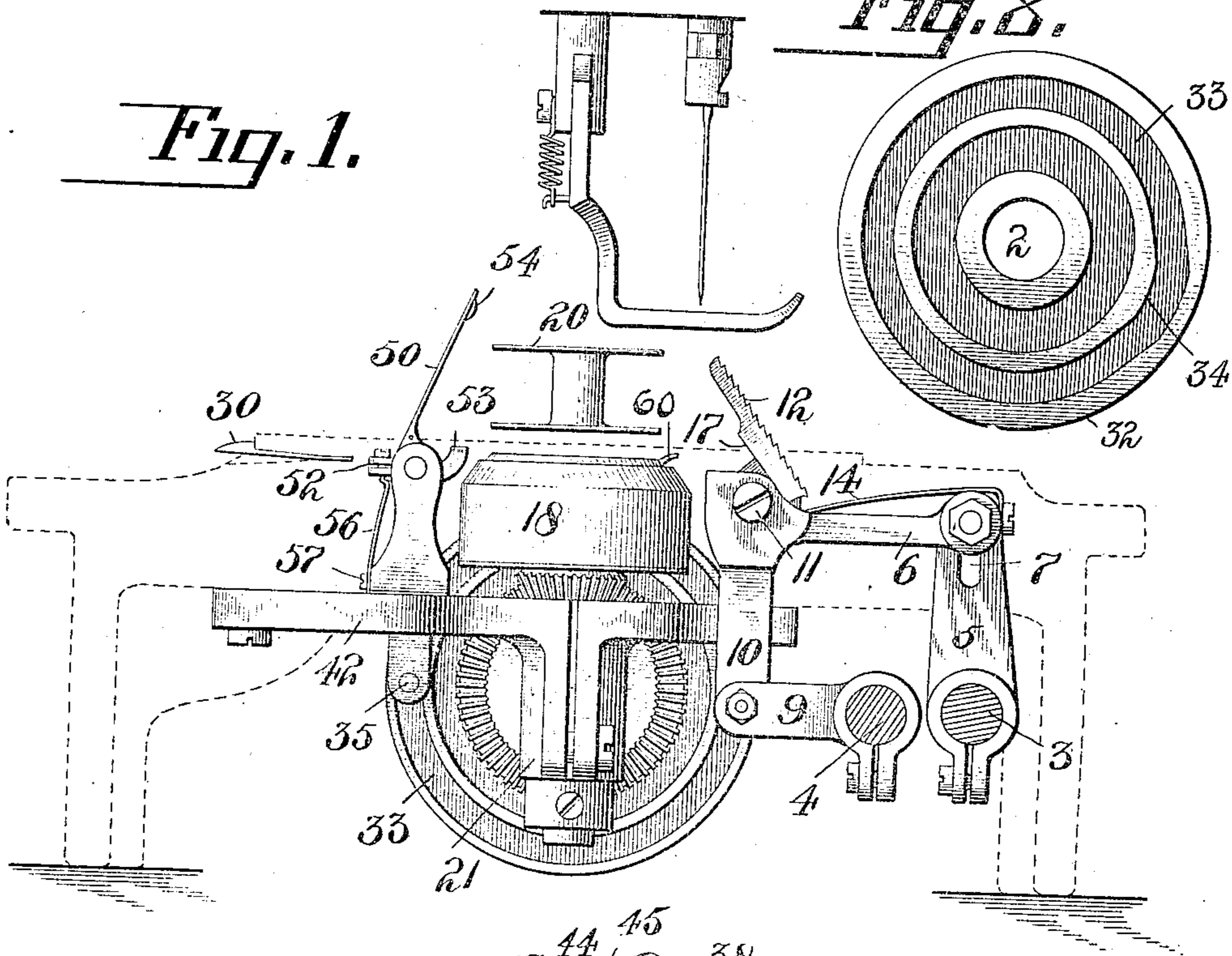


Fig. 8.

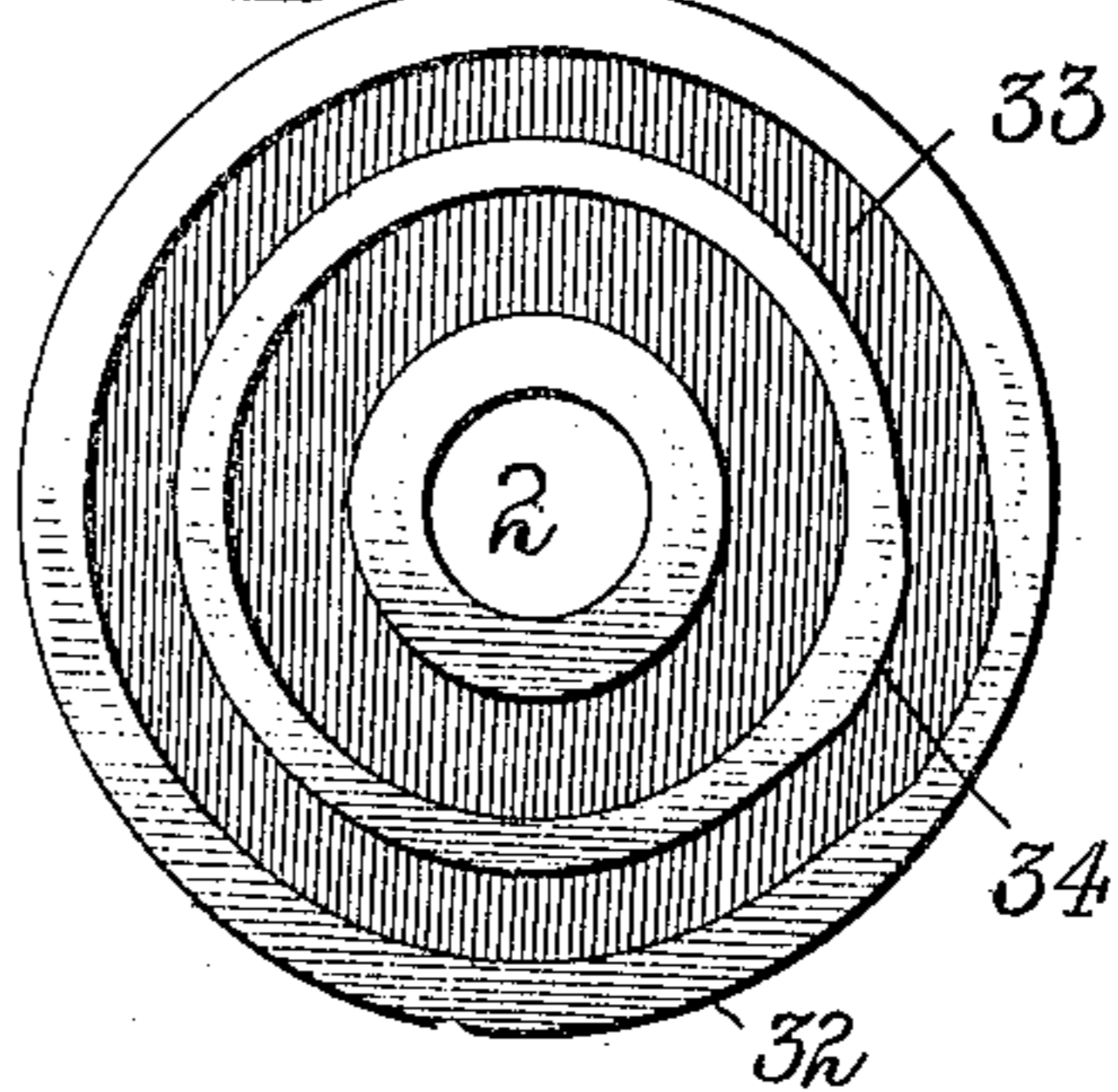


Fig. 3.

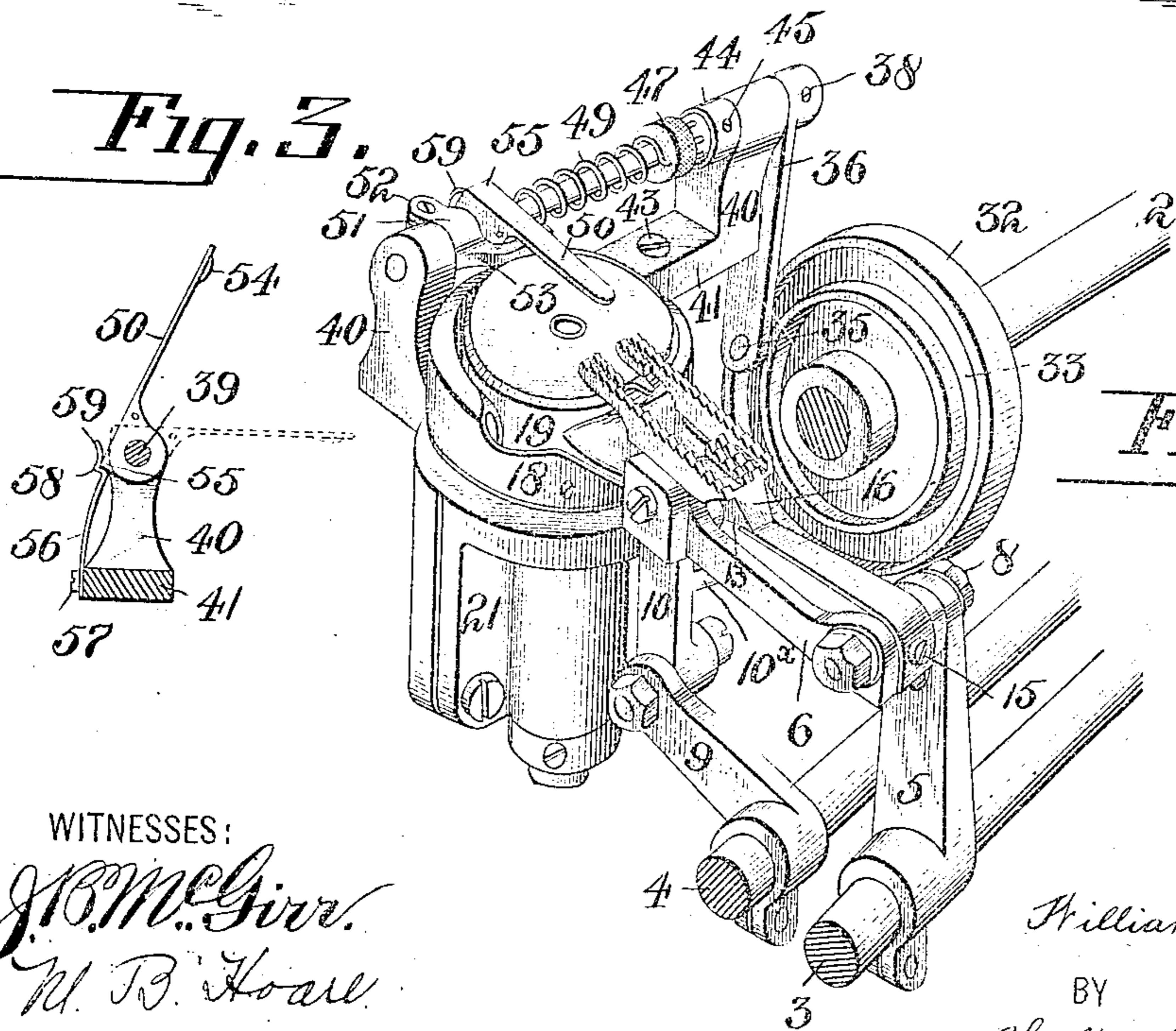


Fig. 2.

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2 SHEETS—SHEET 2.

Fig. 4.

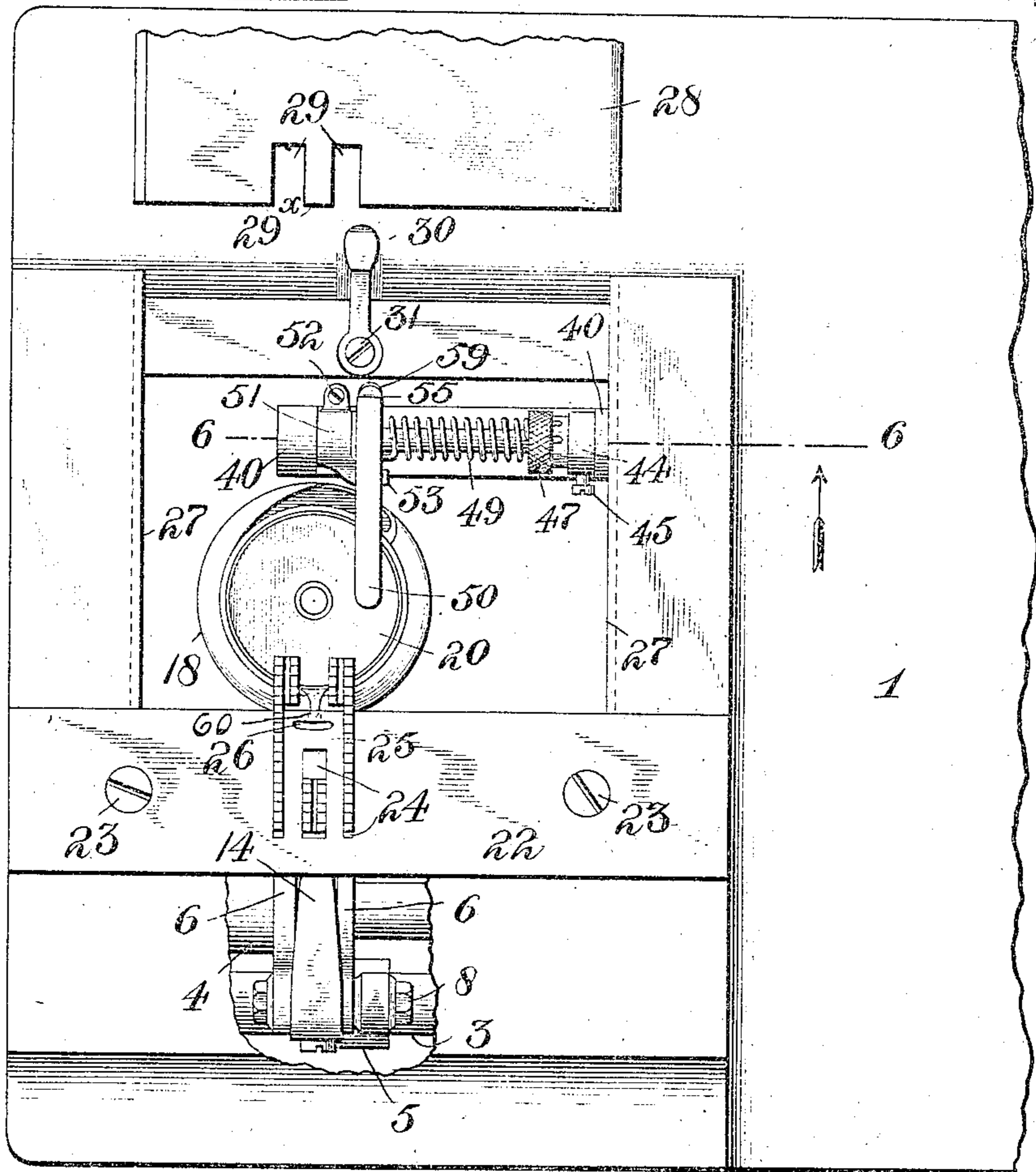


Fig. 5.

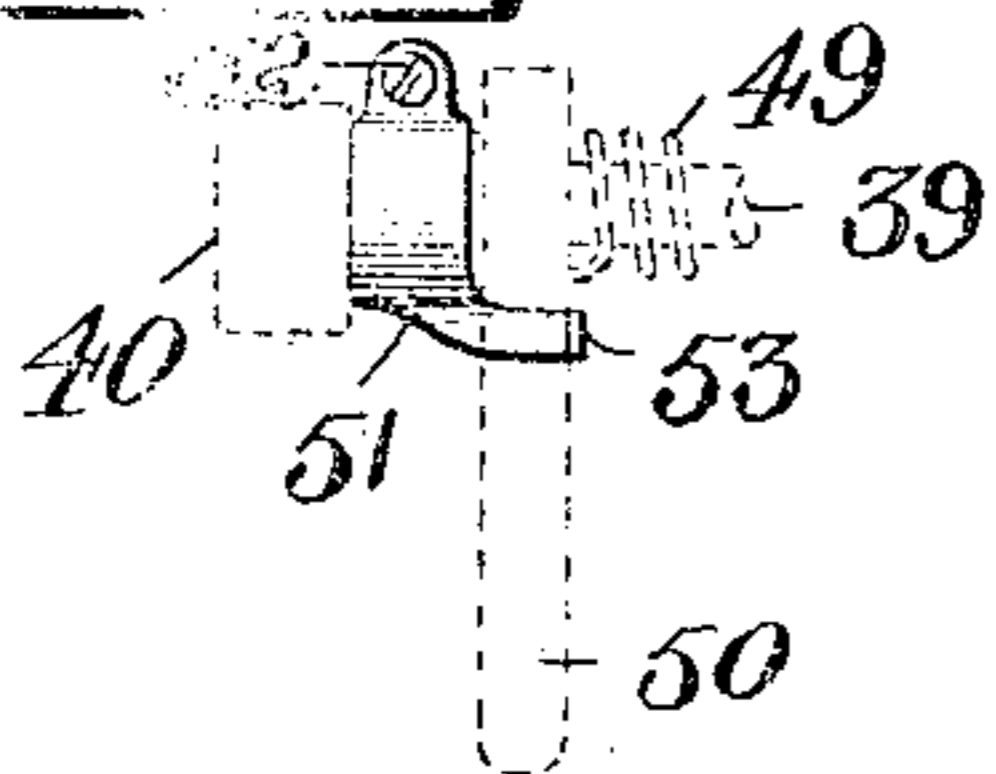


Fig. 6.

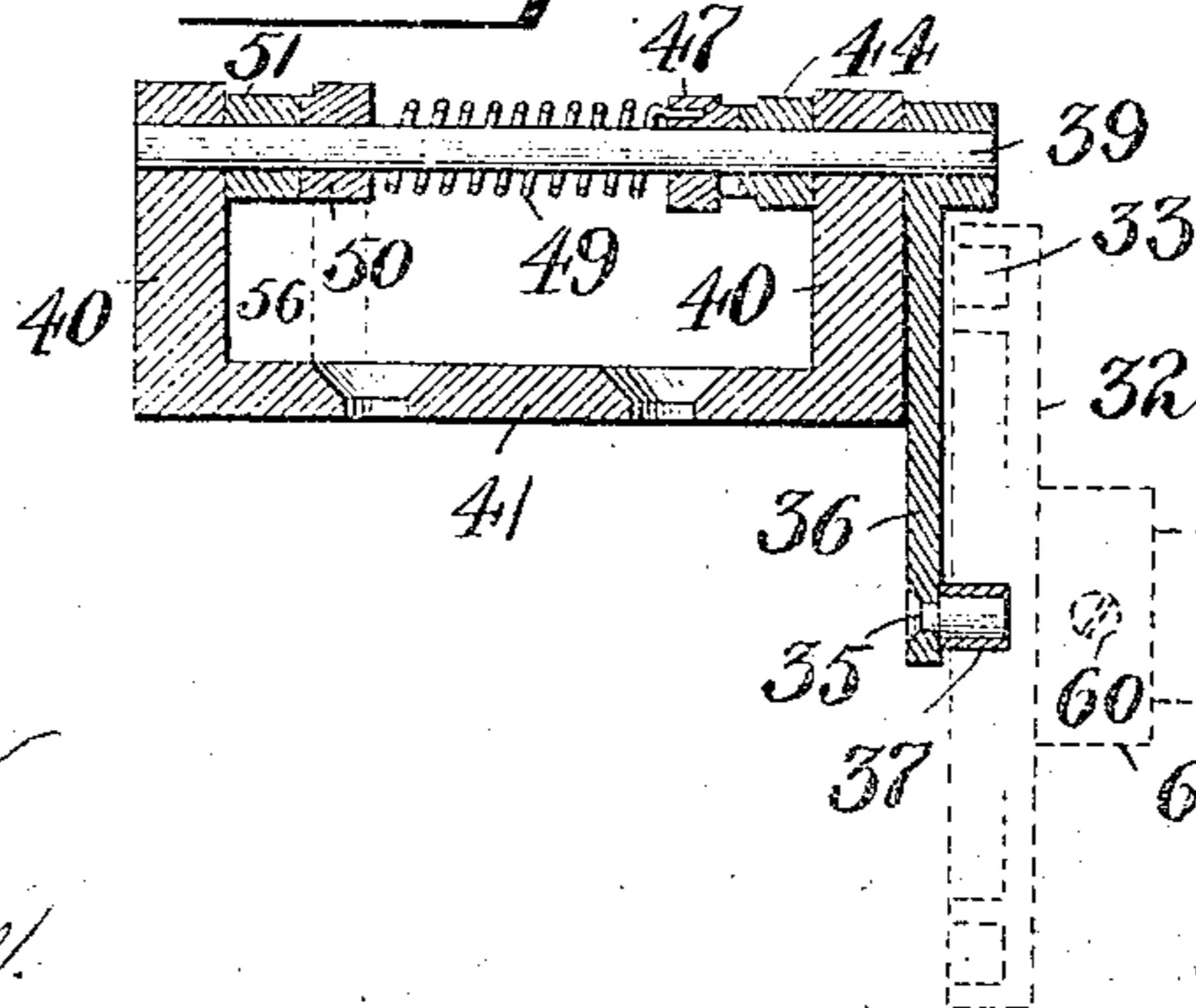
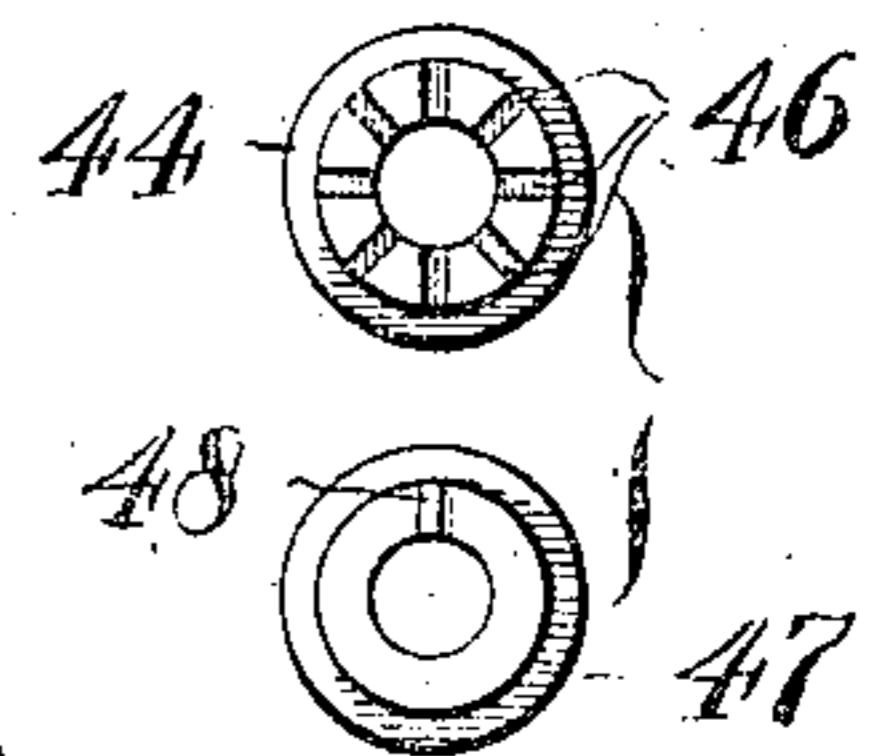


Fig. 7.



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BOBBIN-CONTROLLING MECHANISM FOR SEWING-MACHINES.

No. 875,613.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed April 27, 1903. Serial No. 154,457.

To all whom it may concern:

Be it known that I, WILLIAM N. PARKES, a citizen of the United States, residing in Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Bobbin-Controlling Mechanism for Sewing-Machines, of which the following is a description.

This invention relates to thread-controlling mechanism for sewing machines, applicable more particularly to sewing machines of the lock-stitch type, or those wherein are employed an upper or needle-thread, and a lower or locking-thread.

Specially, this invention is intended to be applied to that class of lock-stitch machines wherein the loop of needle-thread is carried about the lower thread by a hook, though it is to be understood that the invention is not restricted, in its application, to revolving-hook machines, but is applicable to any kind of machine in which a lower, locking-thread is employed and in which the needle-thread is caused to interlock with another thread. Hence, in this specification I purpose employing the term "looper", as a generic designation, to comprehend all the forms of lock-stitch making hooks, shuttles, etc.

In lock-stitch machines the bobbin, cop or mass of locking thread, is held loosely in a bobbin-holder, and when thread is drawn therefrom, in the rapid operation of the machine, the bobbin cop, or mass of thread, is caused to overthrow, or spin, and the thread to spill or uncoil and become tangled or broken. This is specially true when a large bobbin, carrying a large quantity of thread, is employed. Moreover, when a frictional tension is placed directly upon the strand of thread, running from the bobbin, cop, or other mass of thread to the work, it causes the loose thread, between the bobbin and the tension device, to untwist, kink and break; or makes an imperfect place in the stitching. In pulling the kinked portion of the thread through the tension. Furthermore, in these machines the tension being on the bobbin thread all the time, the supply of the same is drawn by the work as it is moved forward to dispose the stitches, and this draw of the thread against said tension by the work is liable to pucker the same, especially if it is composed of thin material, or if long stitches are being made.

The main object of my invention is to pro-

vide improved means for automatically controlling the bobbins in sewing machines so the above, and other defects will not be present in connection with the same. And it is also an important object to control the bobbins and through them the delivery of the thread from the same so that placing a tension on the bobbin thread in these machines may be dispensed with. And still another object is to locate and actuate the parts of which my invention is composed so that the supply of thread from the bobbin will be arrested when the supply for completing a stitch has been drawn. And it is also an object to have these parts act so that the supply for either a long or a short stitch is drawn before the delivery of thread is arrested.

With the above and other objects in view, my invention consists in the various parts, features, and combinations hereinafter described and set forth in the appended claims.

In the drawings: Figure 1 is an end elevation of so much of a sewing machine as is deemed essential to illustrate the disposition and application of my invention; Fig. 2 is a perspective view showing the disposition and relation of the feeding and looper mechanism and the bobbin controlling mechanism; Fig. 3 is a vertical section of a portion of the controller, showing the bobbin controlling finger in two positions, the full lines showing the said finger withdrawn and the dotted lines showing said finger in operative position; Fig. 4 is a plan view of the cloth-plate, a section being removed to show a portion of the feeding-mechanism, and the slide-plate being withdrawn to show the bobbin-controller and its relation to the looper mechanism; Fig. 5 is a detail view in plan of a portion of the bobbin-controlling device, showing in full lines the rest or stop which coöperates with the controlling finger, and which latter, together with other parts adjacent thereto, are shown in dotted lines; Fig. 6 is a longitudinal vertical section on the line 6—6 of Fig. 4; Fig. 7 is a view showing the adjacent faces of the collars, or means, for adjusting the tension of the spring which regulates the pressure of the controlling finger; and Fig. 8 is a face view of the cam-disk containing the groove for actuating the controller.

Primarily, it is to be noted that the stitch-forming mechanism herein illustrated

is or may be the same as that made the subject of my patent, granted June 9, 1903, No. 730,692 and that in said machine the looper and bobbin-holder are preferably disposed in a horizontal plane; the bobbin-holder is supported by, and contained in, the looper, and is held from turning during the operation of the machine; the bobbin-holder is provided with a secondary hook which aids the loop-taking hook of the looper in passing the needle-loop about the holder and locking-thread; no tension is applied directly to the strand of the under thread leading to the work at any time during the operation of the machine, the usual tension device on the bobbin-holder and the various eyes and leads for the thread being dispensed with, thus enabling, in combination with the special construction of looper devices therein described, the use of a bobbin or cop of thread, more than two and one-half times larger than those used in other machines of like character, and also permitting the use of a very much larger bobbin-holder, without increasing the size of the looper or the quantity of needle thread used in the loop passed about the bobbin-holder. It is also to be noted that the extent of the stroke of the take-up is not increased, nor is the quantity of thread drawn through the needle in the stitch formation. Furthermore, the feeding mechanism herein shown and described, the particular disposition of the looper relatively to the feeding mechanism, and the structure of the throat-plate, are or may be substantially the same as those parts which are made the subject-matter of my application No. 150,182, filed March 30, 1903.

I wish to note that throughout the specification and claims, I have employed the terms "bobbin" and "thread" with reference to the mass of locking thread, and I do not intend to be restricted to the technical meaning of such terms; for, it will be obvious that a cop of thread, or a mass thereof in any other form, can be used. Therefore, I desire it to be understood that the terms "bobbin" and "thread" shall be synonymous and comprehend any mass of thread capable of use in connection with my controller, the only essential being that the latter shall act directly upon the mass, or the part that carries the mass, in contradistinction to acting upon a strand, or length, or portion of thread between the work and said mass.

1. indicates the cloth-plate; 2, the lower shaft of the machine, which may be supported in any suitable manner, and from which the two rock-shafts 3, and 4, are actuated by suitable means (not shown), to give the necessary movements to the feed-bar. The rock-shafts are suitably journaled in hangers of the cloth-plate, as usual. The forward end of the shaft 3. is provided with a vertically

disposed arm 5, in the upper end of which is adjustably connected the feed-bar 6, the adjustment being secured by means of a slot 7, and a suitable screw-bolt and nut 8. The rock-shaft 4, is provided with a horizontal arm 9, supporting at its forward end the link 10, extending vertically and provided at its upper end with the fork 10^x, to the prongs of which the forward end of the feed-bar is pivoted by means of the screw-pin 11, free to turn in its bearings and held by a nut. The feed-dog 12, is supported by and pivoted upon the screw-pin 11, within the fork of the link. The feed-dog is provided with an extension 13, having its under side flat and on which bears the flat spring 14, fastened in any suitable manner to the feed-bar, as by means of the screw 15. The extension 13, is also provided with the inclined portion 16, on which bears the spring 14, when the dog is turned up or back as shown in Fig. 1. The under side of the feed-dog is provided with the flat portions 17,—see Fig. 1,—which rest upon corresponding flat portions of the feed-bar, said dog being normally held in the position of Fig. 2, by means of the spring 14. 18, is the looper, located as shown in Figs. 1, 2 and 4, directly below the feed-dog, close to and in rear of the working position of the needle and substantially in the direction of feed. The looper is arranged in a horizontal plane, and carries the bobbin 20, or other mass of thread. This is the preferred disposition of the looper-mechanism; but, it will be obvious that the said mechanism may be otherwise disposed and good results secured by the use of my bobbin-controller presently to be described. The gearing shown drives the looper, giving the same two rotations to a single reciprocation of the needle, as disclosed by my patent above referred to. The other parts of the looper mechanism are indicated, generally, by 21, and as the same separately forms no part of my invention, they are not further described.

With the above disposition of looper and feed mechanism, it is important to so construct the cloth-plate that ready access may be had to the looper mechanism for any desired purpose. To this end the throat-plate of the machine includes the elongated plate 22, which is fastened removably to the cloth-plate by screws 23, has in one side the feed slots 24, some of which are open-ended and form the tongue 25, which latter contains the needle aperture 26. The cloth-plate is provided with ways 27, in which slides the section 28, of the throat-plate and which is provided with the open ended slots 29, to receive the portions, of the feed-dog which overlap the looper-mechanism, and between which slots is formed the tongue 29^x. A spring catch 30, of any suitable character is secured to the cloth-plate by means of the screw 31, and is so located as to hold the

in position when in place. This disposition and construction are disclosed in my application No. 150,182, above noted.

The bobbin-controlling mechanism consists of the cam disk 32, carried by the shaft 2, and having therein the cam-groove 33, provided with the swell or projection 34. In said cam-groove runs a pin 35, carried by an arm 36, and having an anti-friction roll 37. The arm is suitably secured, as by a screw 38, to the end of a rock-shaft 39, journaled in arms 40, of a bracket 41, secured to any suitable stationary part of the machine, or bracket thereof, as 42, by means of screws 43. Between the arms of the bracket, the shaft 39, is provided with a collar 44, fixed thereto by a screw 45, and which collar has in its face a series of radial slots 46. Next the collar 44, loose upon the shaft 39, is placed a collar 47, having its periphery knurled and also having its face, adjacent the collar 44, provided with a lug or pin 48, which registers with and enters any one of the radial slots 46, according to its adjustment. Connected to the collar 47, is a spring 49, coiled about the shaft 39, and having its other end suitably secured to the thread-controlling finger 50, which is loosely sleeved upon and carried by shaft 39. Upon the shaft 39, next the thread controlling finger, and between the same and the adjacent arm 40, of the bracket 41, is clamped a support 51, for the thread controlling finger. Said support consists of a split sleeve which embraces the shaft 39, and is clamped thereto by a screw 52, passing through the ends of the sleeve; and the latter is provided with a rest 53, extending under the thread controlling finger 50. Obviously, the support for the finger may be adjusted so as to regulate the normal position of rest of the thread-controlling finger, or the extent of movement of the controller toward the thread and prevent the latter from being forced with excessive pressure upon the bobbin. And whatever pressure is desired the same can be secured and nicely and accurately regulated by adjusting the collar 47, so as to increase or decrease the tension 49, upon said finger. To facilitate the passing of the thread between the controlling finger and the bobbin and for the purpose of furnishing the finger with a suitable engaging part for contact with the bobbin, the finger is provided with a convex boss 54.

In order to enable the finger 50, to be withdrawn, so as to permit the bobbin or other parts of the looper-mechanism to be removed, adjusted, or otherwise manipulated, it is provided with any suitable form of lug or projection 55, at its heel, which is engaged by the upper end of a spring 56, secured to the bracket 41, by a screw 57. The said upper end of the spring is formed so as to provide a notch and shoulder at 58, to

receive the heel portion of the finger and retain the latter in its withdrawn position, as shown in Figs. 1 and 3, said finger being retained in its operative position by means of the extension 59, of the spring, which bears upon said heel portion. The cam disk 32, is rendered circularly adjustable upon the shaft 2, by means of a screw 60, tapped through the hub 61, of said disk and connecting the shaft 2. By thus adjusting the cam disk 32, its elevation or swell 34, can be disposed so as to cause the actuation of the thread-controlling finger at any given time relatively to the action of the feed, the looper and the take-up. This timing is important in that it permits of the action of the controller being adjusted to properly cooperate with the other parts of the stitch forming mechanism and feeding mechanism. In practice in sewing machines the movement of the feed is timed so that the movement of the work is finished at substantially the same time that the take-up finishes its upward or stitch setting movement. In my invention the controller cam is adapted so that it acts with the take-up and the feed, and just at the time these elements finish their functional stroke the bobbin controller engages the bobbin and arrests the further delivery of thread from the same.

In connection with the bobbin contact part 50 it is noted that it receives all of its movements from the action of the cam groove 33. The shaft 39 is obviously oscillated from the action of said cam groove, and the part 47 by reason of its engagement with the collar 44 secured to the shaft 39, is turned positively with said shaft. This stop 53 being secured to said shaft it also turns positively with the same. In practice the tension of the spring 49 is adjusted so that it is sufficient to hold the finger 50 in engagement with the stop 53 under any speed that the machine is run at, this being desirable to insure the engagement between the finger and the bobbin at the proper time.

In the operation of the controller to engage the bobbin the functional portion 34 of the cam groove 33 moves the arm 36 laterally and thereby turns the shaft 39 and all the parts carried by said shaft in one direction. The parts are so adjusted that just previous to the finishing of their movement in said direction the finger 50 comes into engagement with the bobbin and further movement of said finger is thereby positively arrested. The other parts of the controller move slightly further in said direction after said engagement takes place, and the stop 53 is thereby just moved out of engagement with the finger 50. It is thus seen that the stop moves away from the finger against the action of the spring 49. At this point there is a dwell in the portion 34 of the cam groove 33 of sufficient extent to permit the stitch form-

ing mechanism to set the stitch, and the take-up to commence a return movement for a succeeding stitch. Then the cam groove moves the arm 36 in an opposite direction the shaft 39 is thereby turned in an opposite direction, the stop 53 again engages the finger 50 and positively lifts the same from the bobbin. It is thus seen that the parts are actuated by the cam groove 33 in both directions and that the function of the spring 49 is to yieldingly hold the contact part 50 into engagement with the part that actuates it, and thereby provide a yielding engagement between the controller mechanism and the bobbin.

The distinction between holding two parts together by a spring, and the movement of one part relative to another by a spring is to be noted. In the present form of my invention the controller mechanism is actuated by the functional part of the cam groove 33, but the bobbin contact part of said mechanism is adapted to yieldingly engage the bobbin. The spring in this mechanism holds two parts together, but does not move one part relative to another. It is therefore seen that all the parts of my present controller mechanism derive their movements from a positively actuating cam. And it is also seen that all the parts move positively except the bobbin contact part and the spring which adapts said part to yieldingly engage the bobbin.

In my co-pending application Serial No. 85,471, filed December 11, 1901, a bobbin controller mechanism is described, which is in engagement with a peripheral cam, and is held in engagement with said cam by a spring. Consequently the controller mechanism is operated positively in one direction by the cam and in the opposite direction by a spring. In contradistinction to the mechanism in my said co-pending application my present controller mechanism is operated in both directions by a positive cam and by reason of this it may be run at a much higher rate of speed than the mechanism shown in my said co-pending application.

Having the bobbin contact part of my controller mechanism yielding, as in my present invention, is advantageous for various reasons. For example by this means the necessity of having all the bobbins just the same thickness is avoided, and the necessity of having the working position of said contact part such that it just contacts with the bobbin is also avoided. An unnecessary heavy pressure on the bobbin would of course be objectionable, this yielding means avoids this even though the parts are not adjusted absolutely correct. In connection with the movement of this yielding finger it is noted that the same is constructed so that it is very light, and as it is only necessary to move it enough to permit of the passage of a single

strand of thread between it and the bobbin, and as there is obviously sufficient time so that even this small movement may be brought about very gradually relative to the cycle of movement of the disk 32, it is evident that a comparatively light tension of the spring 49 will hold the finger against the stop 53.

I prefer an extending finger as shown for the yielding bobbin contact part, because the space between the bobbin and the throat plate that the said contact part has to operate in, is very limited in a machine in which the looper runs in a horizontal plane. And my controller is arranged to cooperate with a looper running in a horizontal plane because the looper in the machine in which I make use of this controller is so operated, but it is to be understood that the use of my controller is not limited to such a machine. It is obvious that various changes might be made in this controller mechanism without departing from the spirit of my invention, therefore it is to be understood that I do not wish to be limited to the exact construction herein disclosed.

Having thus described my invention what I claim and desire to secure by Letters Patents is:

1. In a sewing machine, a stitch forming mechanism comprising a looper, a bobbin support provided with a bobbin means for controlling said bobbin comprising a positively actuating part, and a yielding contact part carried by said positively actuating part for engaging said bobbin.

2. In a sewing machine, a stitch forming mechanism comprising a looper, a bobbin case provided with a bobbin, means for controlling said bobbin comprising a positively actuating part, a yielding contact part carried by said positively actuating part for engaging the bobbin, and means for regulating the pressure of said contact part on the bobbin.

3. A bobbin controller mechanism for sewing machines comprising a grooved cam mounted on the main shaft, a second shaft having a bobbin contact piece mounted thereon, a connection between the second shaft and the grooved cam, and means whereby the contact piece may yieldingly engage the bobbin.

4. A bobbin controller mechanism for sewing machines comprising a part in which a cam groove is formed, a shaft and a connection between the same and said cam groove, a bobbin contact part carried by said shaft, and means also carried by said shaft for regulating the yielding pressure of said contact part on a bobbin.

5. A sewing machine comprising a looper, a bobbin carried by said looper, a bobbin controller mechanism having a pivoted bobbin contact part that extends over said bobbin,

means adapting said bobbin contact part to be turned on its pivot and thereby removed from above said bobbin, a feed mechanism comprising a pivoted feed dog which
5 extends over said bobbin, and means adapting said feed dog to be turned on its pivot and thereby removed from above said bobbin.

6. A thread-controlling mechanism for sewing machines comprising a rock-shaft,
10 means for actuating the same, a thread-controlling finger carried by said shaft, a spring coiled upon the shaft and connected to the finger, means for regulating the tension of the spring, and means for limiting the move-
15 ment of the finger in one direction.

7. A thread-controlling mechanism for sewing machines comprising a rock-shaft, means for actuating the same, a thread-controlling finger carried thereby, and means
20 adjustable on the shaft and engaging the finger for limiting the movement of the latter in one direction.

8. A thread-controlling mechanism for sewing machines comprising a bracket, a
25 shaft journaled therein, means for actuating the shaft, a thread-controlling finger carried by the shaft, and means for limiting the movement of the finger in one direction.

9. A thread-controlling mechanism for
30 sewing machines comprising a rock-shaft; means for actuating the same; a thread-controlling finger loosely carried by the rock-shaft; means on the shaft for controlling the actuation of the finger.

35 10. In combination, a stitch-forming mechanism comprising a needle and looper; a thread-controller; a feeding mechanism having a dog disposed so as to extend partially over the looper, and the latter being disposed
40 between the feed and controller; and means for moving the dog aside so parts of the looper may be removed from the machine.

11. In combination, a stitch-forming mechanism comprising a needle and looper; a
45 feeding mechanism; and a thread-controlling mechanism; the looper being disposed in a horizontal plane between the feeding and a portion of the controlling mechanisms, and the thread-controlling mechanism having a
50 finger overlapping the looper; and means

whereby the finger may be moved aside so the parts of the looper may be removed from the machine.

12. In combination, a stitch-forming mechanism comprising a needle and looper; a
55 thread-controller; a feed mechanism having a pivoted dog disposed so as to extend partially over the looper; and the looper being disposed in rear of the feed mechanism substantially in the line of feed and between said
60 feed mechanism and the controller.

13. In combination, a stitch-forming mechanism comprising a needle and looper; a feeding mechanism having a dog disposed so as to extend partially over the looper; a thread-
65 controller having a finger disposed so as to extend partially over the looper; the looper being disposed between the controller and feed mechanism; and mechanisms for moving the dog and finger aside so the parts of
70 the looper may be removed from the machine.

14. In combination, a stitch-forming mechanism comprising a needle and looper; a feeding mechanism having a pivoted dog; and a
75 thread-controller having a pivotal finger; the looper being disposed between the feed and controller and below the dog and finger, and both the dog and finger being extended partially over the looper.
80

15. A sewing machine having a looper disposed in substantially a horizontal plane; a feeding mechanism comprising a dog disposed so as to have its feed-movements in a substantially horizontal plane; a thread-
85 controller having a finger disposed in substantially a horizontal plane; the said dog and finger extending partially over the looper; and means for moving the dog and finger vertically away from the looper so the latter
90 may be removed from the machine through the cloth-plate.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM N. PARKES.

Witnesses:

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M. B. HOARE.