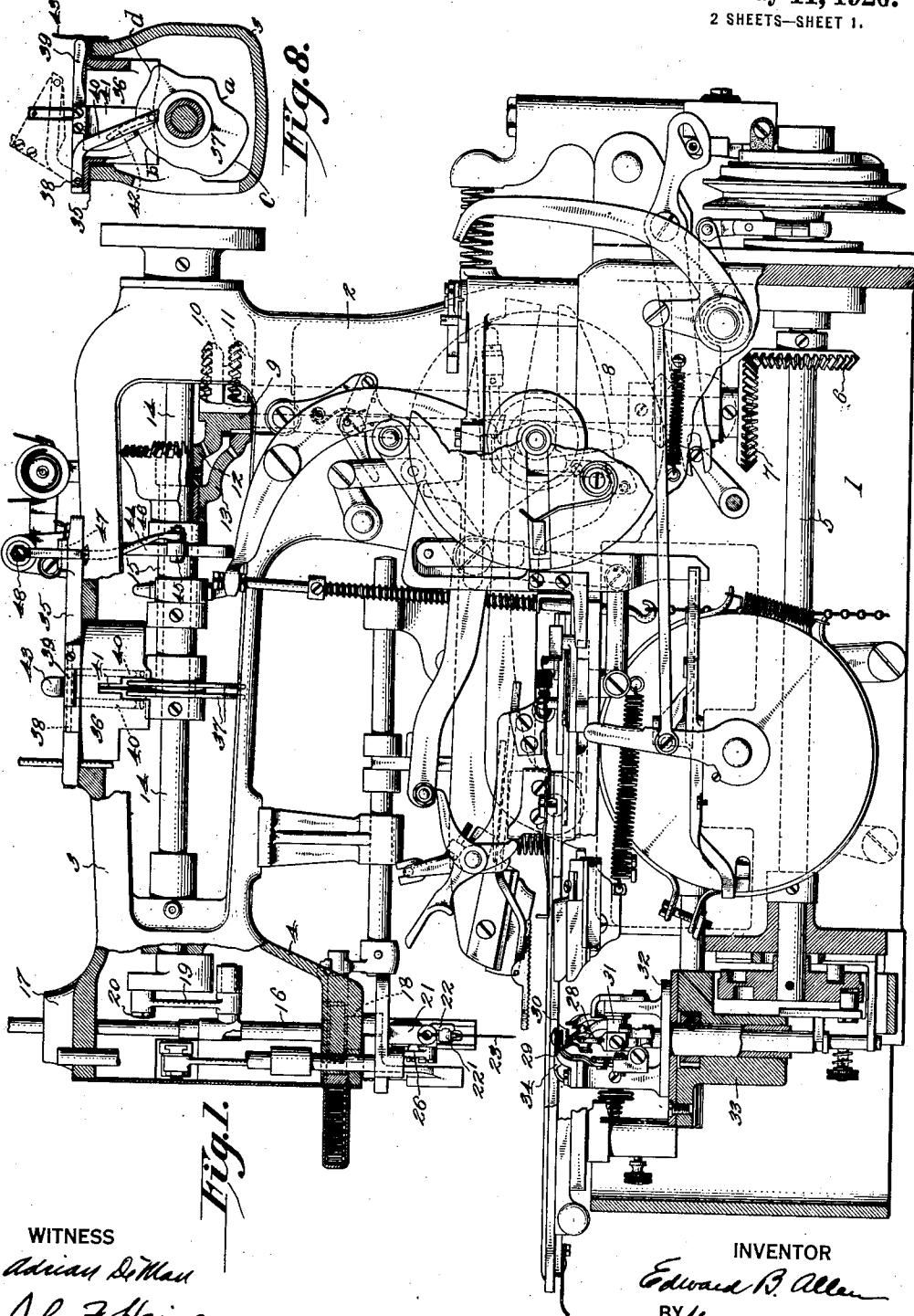


E. B. ALLEN.
THREAD CONTROLLING MECHANISM FOR SEWING MACHINES.
APPLICATION FILED AUG. 10, 1918.

1,339,733.

Patented May 11, 1920.
2 SHEETS—SHEET 1.



WITNESS
Adrian Dittman
John F. Heine

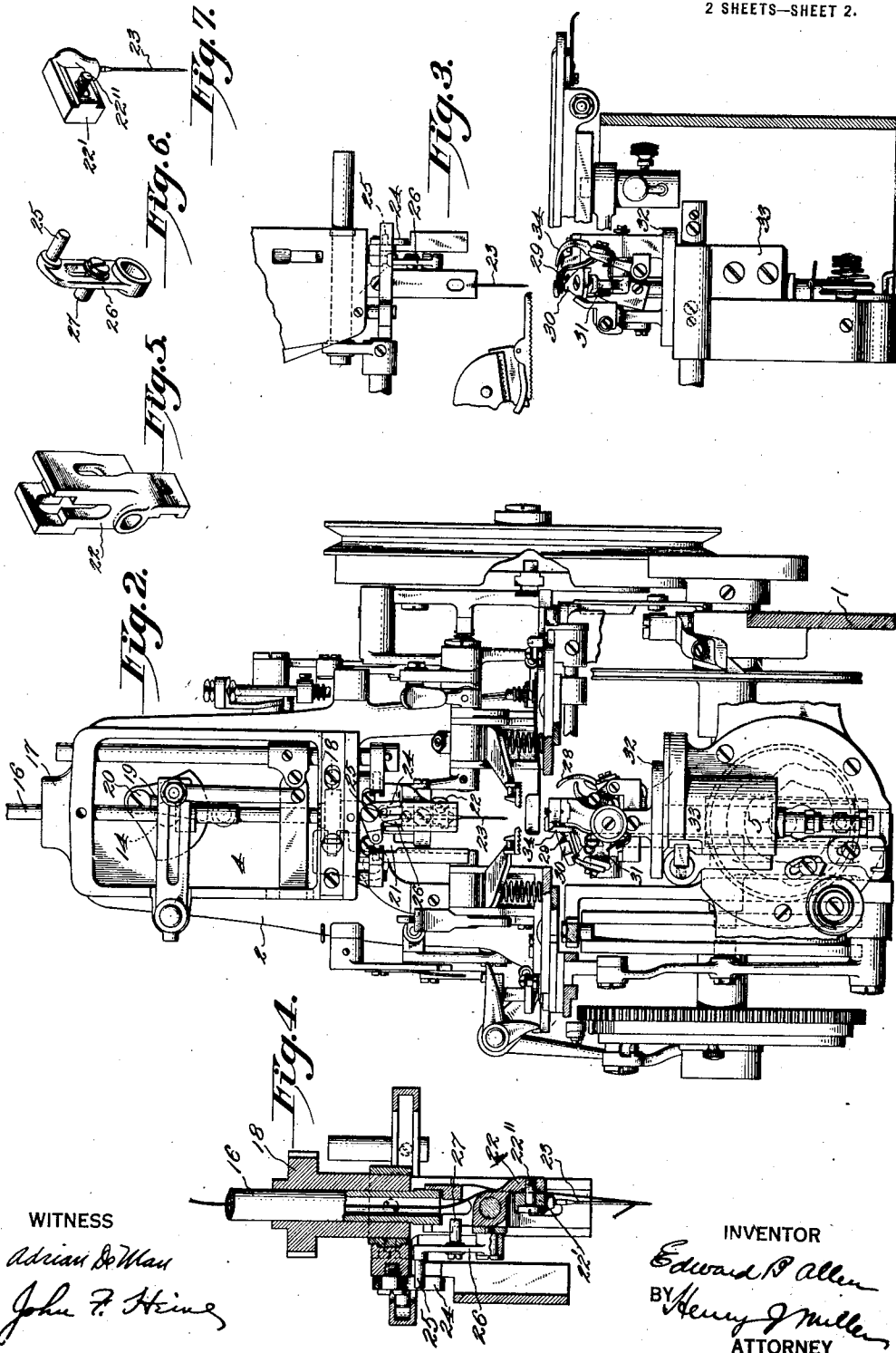
INVENTOR
Edward B. Allen
BY *Henry J. Miller*
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John F. Heine

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UNITED STATES PATENT OFFICE.

EDWARD B. ALLEN, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE SINGER
MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

THREAD-CONTROLLING MECHANISM FOR SEWING-MACHINES.

1,339,733.

Specification of Letters Patent.

Patented May 11, 1920.

Original application filed September 23, 1916, Serial No. 121,733. Divided and this application filed
August 10, 1918. Serial No. 249,250.

To all whom it may concern:

Be it known that I, EDWARD B. ALLEN, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Thread-Controlling Mechanisms for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to thread-controlling mechanism for sewing machines more particularly of the type employing a reciprocating and laterally jogging needle which coöperates, respectively, with each of a plurality of loop-takers in successive reciprocations to form a series of stitches, and has for an object to provide a needle-thread controlling or take-up mechanism which will closely and accurately control the needle-thread at all periods of a complete stitch-forming cycle including successive reciprocations of the needle in coöperation with the action of each of the loop-takers.

Heretofore, in machines of this character, it has been customary to employ a take-up connected in one-to-one operating relation with the needle driving shaft, whereby the take-up was caused to have the same action on the needle-thread for each reciprocation of the needle regardless of which particular loop-taker the needle was coöperating with at the time. The present invention aims to improve the operation of the machine by providing a take-up which will act differently upon the needle-thread in successive reciprocations of the needle; the take-up being constructed and timed to properly control the needle-thread to meet the requirements of each of the successively acting loop-takers.

In carrying the invention into effect it has been applied to the machine disclosed in my copending application Serial No. 121,733, filed September 23, 1916, of which this application is a division; and having a reciprocating and laterally jogging needle coöperating alternately in successive re-

ciprocation with threaded and non-thread loop-takers. In the present embodiment of the invention the take-up is in the form of a pair of thread-engaging cam-disks having similarly shaped active edge-portions adapted to deflect the needle thread extending between a pair of guide-arms. The take-up disks are mounted upon a shaft which is geared to rotate at one-half the speed of the needle-driving shaft, so that it will make one complete revolution for each complete stitch-forming cycle, including, in the present instance, two complete reciprocations of the needle.

The invention will be more fully understood by referring to the accompanying drawings, in which Figure 1 is a side elevation of a machine embodying the invention. Fig. 2 is a front elevation of the machine. Fig. 3 is a side view of the stitch-forming instrumentalities, from the side opposite to that shown in Fig. 1. Fig. 4 is a sectional view of the needle-jogging mechanism. Figs. 5, 6 and 7 are detail perspective views of parts shown in Fig. 4. Fig. 8 is a vertical section through the bracket-arm, showing the take-up.

As represented in the drawings, the frame of the machine is constructed with the hollow base 1 from which rises the bracket-arm composed of the standard 2 and tubular overhanging arm 3 terminating in the hollow head 4. Journalled within and longitudinally of the base 1 is the main-shaft 5 carrying near its rearward end the bevel gear 6 meshing with a similar gear 7 secured upon the lower end of the upright shaft 8. Secured upon the upper end of the shaft 8 is the hub 9 of a bevel gear 10 beneath which and upon the hub 9 is secured the similar bevel gear 11. Meshing with the gears 10 and 11 are the smaller and larger bevel-gears 12 and 13, respectively, the one being fixed upon the upper needle driving shaft 14 journalled in the member 3 of the bracket-arm and the other fixed upon the rearward end of the tubular shaft or sleeve 15 surrounding the shaft

14 and adapted to rotate independently thereof. As represented in Fig. 1, the intermeshing gears 11 and 13 are of the same diameter to transmit operative movements from the shaft 8 to the sleeve 15 in one-to-one relation, while the driven bevel-gear or pinion 12 is of one-half the diameter of the driving bevel-gear 10, whereby the needle-driving shaft 14 is driven at double the speed of the upright shaft 8.

In general construction and arrangement of parts, the needle mechanism of the present improvement is similar to that of my Patent No. 1,161,277, of November 23, 1915, the tubular needle-bar 16 being journaled in upper and lower bearings afforded respectively by the boss 17 and the rotary sleeve 18, and deriving its reciprocatory movements from connections including the pitman 19 and the crank-element 20 secured upon the forward end of the needle-actuating shaft 14.

The needle-bar sustains at its lower end a yoke 21 upon which is slidingly mounted the laterally jogging needle-holding block 22 in which is secured the shank of the needle 23. The block 22 is provided with a laterally adjustable section 22' secured thereto by a clamp-screw 22'' by means of which the lateral working position of the needle may be determined. In the present needle-jogging mechanism, the forked arm 24 of the angular switch-lever embraces a lateral pin 25 of an intermediate lever 26 fulcrumed upon the needle-bar yoke 21 and carrying a shouldered stud 27 entering a slot of the needle-holding block. The stud 27 is adjustable in a slot extending lengthwise of the lever 26, so as to provide for adjustment of the amplitude of lateral jogging movements of the needle.

The loop-taking mechanism cooperating with the reciprocating and jogging needle is preferably constructed substantially in accordance with that of my Patent No. 1,030,046, of June 18, 1912, and comprises the eyed looper 28 and opposed non-threaded looper 29 with overlying spreader 30, all mounted upon the rocking looper-carrier 31 which is sustained by the rotary turret 32 journaled in a bearing bracket 33 sustained within the base 1. Cooperating with the threaded looper 29 and working transversely thereof is the loop-detainer 34. The looper mechanism cooperates with the laterally jogging needle 23 in the production of a chain-stitch overseam.

Depending from the arm cover-plate 35 is a well 36 having in its bottom a transverse slot to receive the upper side of a compound take-up cam comprising spaced disks 37 fixed upon the tubular shaft or sleeve 15. Pivotally mounted within a transverse channel of the cover-plate 35 by means of a pin

38 is a cross-bar 39 carrying the depending arms 40 formed with thread-eyes at their lower ends and embracing the take-up cam-disks. The cross-bar sustains also a depending plate 41 entering the space intermediate the take-up disks 37 and provided with the curved thread-guiding slots 42 of which the lower end terminates in register with the thread-eyes of the arms 40. The bar 39 is normally maintained in operative position by means of the spring 43.

The take-up disks 37 are of similar contour, each being formed upon opposite sides of its axis of movement with active edge portions at different distances from such axis. The active peripheral portions of the cam 37 between the points *a* and *b*, including the peak *c*, act upon the needle-thread passing through the guide-eyes of the arms 40 in the cooperation of the non-threaded looper and spreader with the needle in a greater degree than the remaining portion of the cam including the peak *d* in cooperation with the threaded looper. The object of this is to accommodate the take-up to the slightly different conditions involved in the employment of alternately acting loop-taking devices of different character, so as to secure the utmost efficiency in the control of the needle-thread in its manipulation by the loop-taking elements under all conditions.

The tubular shaft 15 is shown having secured thereon the cam-disk 44 peripherally engaging the roller-stud 45 upon the depending arm 46 of a rock-lever fulcrumed upon the pin 47 within a slot of the cover-plate 35 and having an upwardly extending arm carrying a contact screw-pin 48 adapted for engagement with a needle-thread nipping device of well known form.

The invention is not to be understood as limited to use in a buttonhole sewing machine as it may obviously be used in any kind of sewing machine employing a single needle in cooperation with a plurality of loop-takers,

Having thus set forth the nature of the invention, what I claim herein is—

1. In a sewing machine, in combination, a reciprocating needle, loop-takers of different character cooperating alternately therewith in successive reciprocations for production of stitches, and a needle-thread take-up acting in different degree upon the thread respectively in successive stitch-forming cycles.

2. In a sewing machine, in combination, a reciprocating needle, threaded and non-threaded loopers cooperating alternately therewith in successive reciprocations for production of stitches, and a needle-thread take-up cooperating in a certain extent upon the thread in the cooperation of the threaded

looper with the needle and in a greater extent in the coöperation of the non-threaded looper with the needle.

3. In a sewing machine, in combination, a reciprocating needle, loop-takers of different character coöperating alternately therewith in successive reciprocations for production of stitches, and a take-up com-

prising a cam-disk rotating with one-half the frequency of the needle reciprocations and having a thread-engaging periphery adapted for different action upon the thread respectively at different sides of a diameter. 10

In testimony whereof, I have signed my name to this specification.

EDWARD B. ALLEN.