

May 9, 1933.

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1,907,434

SEWING MACHINE

Original Filed June 8, 1926 4 Sheets-Sheet 2

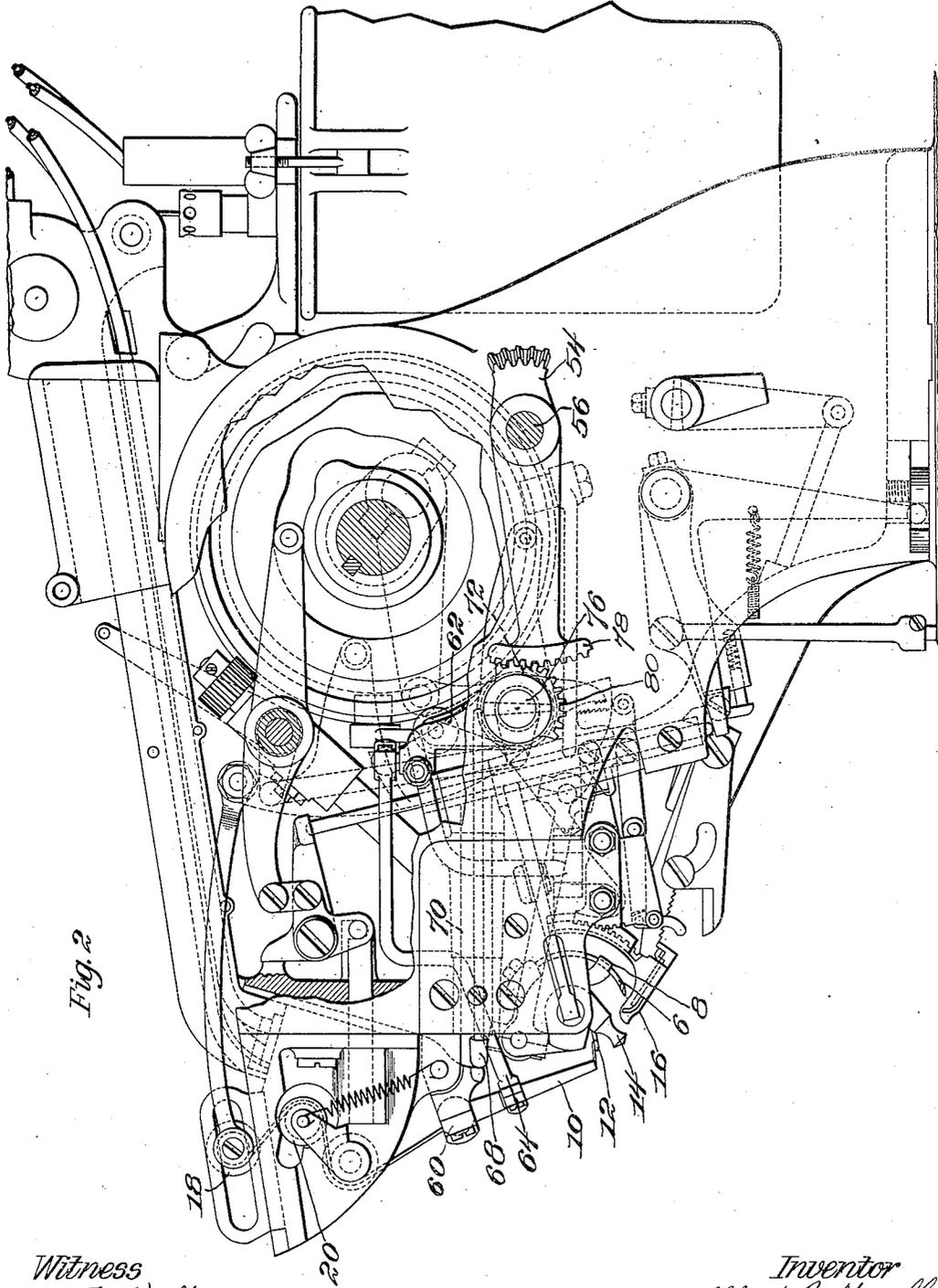


Fig. 2

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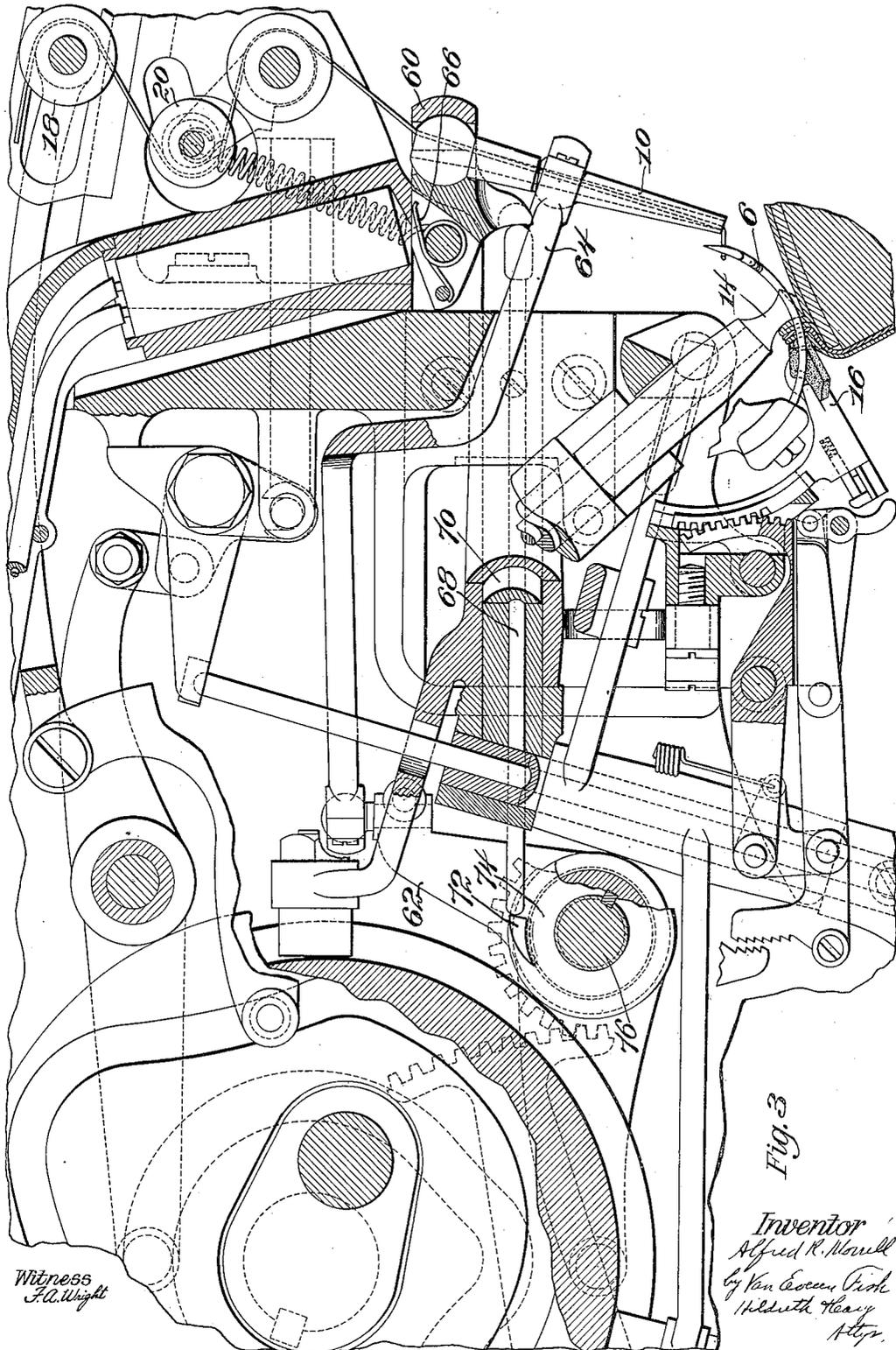


Fig. 3

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SEWING MACHINE

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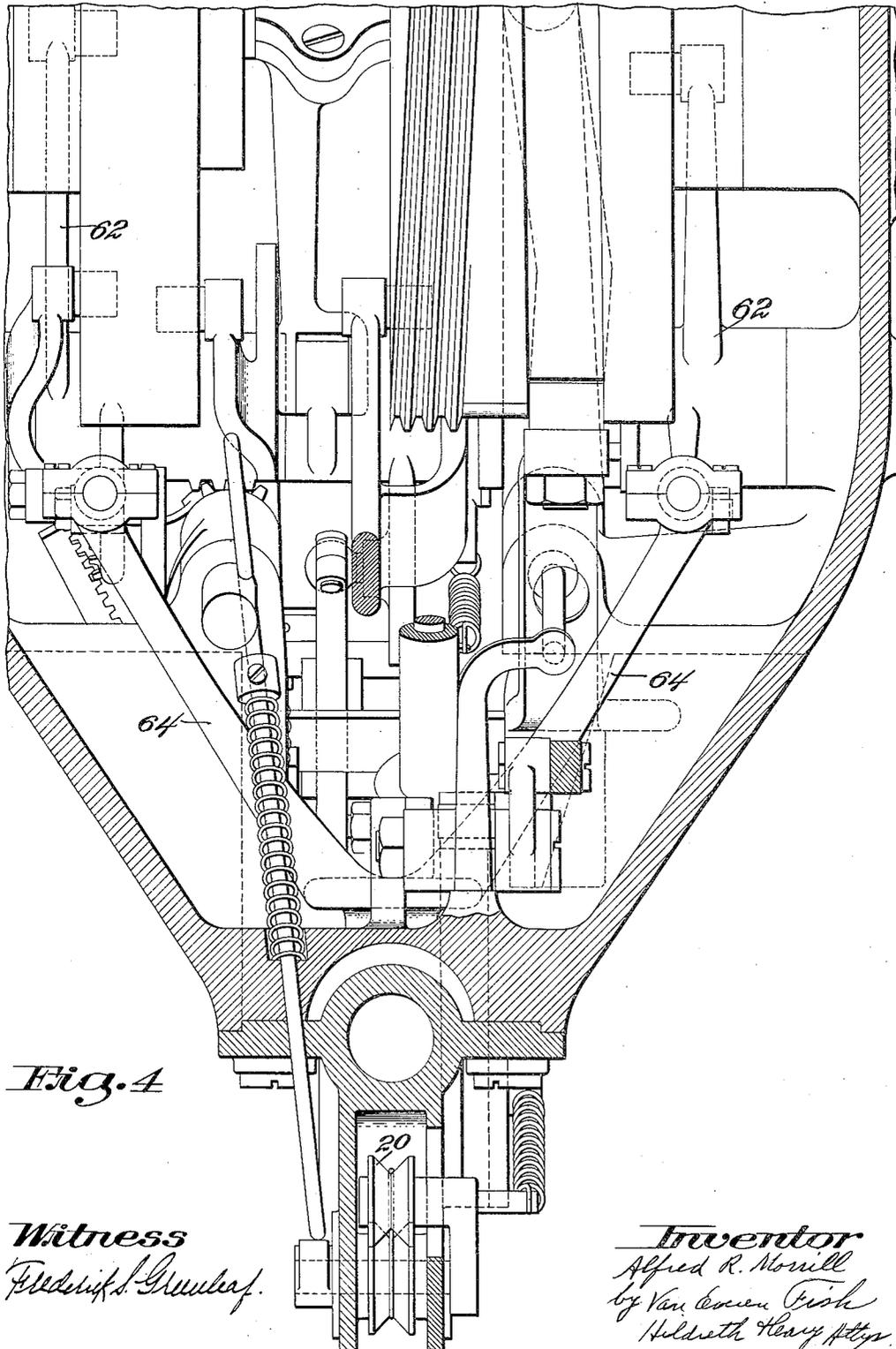


Fig. 4

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UNITED STATES PATENT OFFICE

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SEWING MACHINE

Original application filed June 8, 1926, Serial No. 114,441. Divided and this application filed October 2, 1931. Serial No. 566,475.

The present invention relates to sewing machines and more particularly to a novel and improved means for preventing the threading or looping of the needle of a hook needle sewing machine as the machine comes to rest at the conclusion of a sewing operation. The invention as herein disclosed is embodied in the automatic inseam shoe sewing machine disclosed in applicant's pending application Serial No. 114,441 filed June 8, 1926 for improvements in Shoe machines, of which the present application is a division. The several features of the present invention, however, are not limited to use in an automatic machine such as is disclosed in said application but may be embodied in sewing machines which are not automatic or in machines for performing other sewing operations.

The several features of the present invention consist in the combinations and arrangements of parts hereinafter described and claimed. The several features of the invention and the advantages secured thereby will be readily understood by those skilled in the art from the following description taken in connection with the accompanying drawings in which Fig. 1 is a view in front elevation of an automatic welt shoe sewing machine embodying the features of the present invention; Fig. 2 is a view in side elevation, partly broken away, of the sewing machine head looking toward the left as viewed in Fig. 1; Fig. 3 is a detail sectional elevation of a portion of the sewing mechanism taken on a plane substantially coincident with that of the channel guide axis and looking toward the right as viewed in Fig. 1; and Fig. 4 is a plan view partly in section illustrating a portion of the mechanism in the sewing machine head.

The machine as shown is provided with stitch forming instrumentalities including a curved hook needle 6, a needle guide 8, a looper 10, a thread finger 12, a channel guide roll 14, a welt guide 16, a take-up 18, and an auxiliary take-up 20. The shoe is supported upon a jack 22 arranged for movement to turn the shoe relatively to the operating means to transfer the point of operation

about the shoe, and pattern cams 24 operate to impart work feeding and positioning movements to the jack. The general arrangement and operation of these parts are the same as in the machine of the patent to Laurence E. Topham and Alfred R. Morrill No. 1,616,714, dated February 8, 1927, and like that machine, the illustrated machine is provided with a driving mechanism from which the sewing mechanism and the pattern cam mechanism are driven, and with a stopping mechanism which, at the completion of the sewing operation, is automatically thrown into operation to disconnect the sewing and pattern cam mechanism from the driving mechanism.

As usual in this type of machine, at the end of a sewing operation the needle comes to rest at the limit of its retracting stroke, thus permitting the removal of the work without first disengaging the needle therefrom. In order that the needle may come to rest with no thread in its hook, a feature of the present invention contemplates the provision of simplified and improved means for preventing the looper from laying the thread in the hook of the needle during the final cycle of operations of the stitch forming devices. In the illustrated machine, this feature of the invention is embodied in a looper mechanism comprising a looper lever connected by a universal joint to a looper lever support and means acting when thrown into operation to move the support so as to prevent the thread from being laid in the hook of the needle during the continued movement of the looper lever. The invention contemplates moving the support in any direction which will prevent the looper lever from laying thread in the hook of the needle. In the preferred illustrated construction the direction of movement of the support is such that the looper lever is moved in a direction substantially lengthwise of the needle. To move the looper support at the desired time during the final cycle of operations of the stitch forming devices, the means in the illustrated machine for moving the looper are arranged to be actuated from the stopping mechanism of the machine.

The stopping mechanism is similar to that of the machine of Patent No. 1,616,714 above referred to and comprises a bell crank lever 26, the horizontal arm of which engages a cam groove 28 in the sleeve 30 from which the sewing mechanism and pattern cam mechanism are driven and the vertical arm of which is provided at its lower end with a hole adapted to receive a locking bolt 32 (see Fig. 1). During the sewing operation, the locking bolt is held in retracted position. Said bolt is mounted in one end of a horizontally movable locking bolt carrier 34, the other end of which projects beyond the machine frame and is acted upon by a spring 36 which bears against a collar on the carrier and tends to move the carrier towards the left, as viewed in Fig. 1. At the end of the sewing operation, the locking bolt 32 is released and is forced by its spring into the hole in the bell crank lever 26 as soon as the hole is brought into alinement with the locking bolt. Continued rotation of the sleeve 30 thereafter oscillates the bell crank lever in a direction to move the locking bolt carrier to the right, as viewed in Fig. 1, against the tension of the spring 36. A partial return movement is permitted to the locking bolt carrier and then its return movement to the left is stopped by a latch. The lower end of the vertical arm of the bell crank lever 26 is now held stationary and continued rotation of the sleeve 30 moves the sleeve downwardly, thereby disconnecting the clutch members 38 and 40 between the sleeve 30 and the source of power and bringing a brake member 42 into engagement with a fixed brake member 44. This disconnects the sewing mechanism and the pattern cam mechanism from the driving mechanism and stops the sewing mechanism with the actuating cam shaft of the sewing mechanism in a predetermined angular position, in which position the needle is retracted from the work. The movement imparted to the locking bolt carrier 34 in stopping the machine rocks a bell crank lever 50, the vertical arm of which is forked and engages the flanged sleeve at the left hand end of the locking bolt carrier. The horizontal arm 52 of the bell crank lever is provided with a bevel gear segment arranged to mesh with a bevel gear segment carried by an arm 54 secured to a rock shaft 56 from which movement is imparted to the looper support as hereinafter described.

The looper mechanism of the illustrated machine is similar to the looper mechanism disclosed in applicant's prior Patent No. 1,543,265, dated June 23, 1925. As has been stated, an improved construction is, however, provided in the illustrated machine for preventing the looping of the needle during the last cycle of operations of the sewing mechanism so that the needle may be stopped in retracted position free of the thread. In

the illustrated construction, the looper consists of a tubular lever projecting downwardly from a support 60 and mounted therein by means of a universal joint consisting of a ball formed at the upper end of the looper lever and a correspondingly shaped socket formed in the support. The looper is actuated to carry its lower end around the needle so as to thread the hook of the needle by means of two cam actuated bell crank levers 62 and a triangularly shaped lever or link 64 connected to the bell crank levers and to the looper lever by universal joints, as in the construction disclosed in Patent No. 1,543,265. To prevent the needle from being threaded during the last cycle of operations of the sewing mechanism, the illustrated machine is provided with means for moving the support 60 so as to raise the looper in a direction substantially lengthwise of the needle. In the construction illustrated, the support 60 is pivotally mounted on the frame of the machine and is normally held by a spring 66 in a position in which the thread will be laid by the looper in the hook of the needle. A rod 68 mounted for convenience in the pivot stud 70 of the welt guide actuating lever is arranged with its forward end adapted to contact with a downward projection from the support 60 and with its rear end in the path of movement of a projection 72 on a collar 74 fast on a rock shaft 76. This shaft is rocked in a clockwise direction, as viewed in Figure 3, during the operation of the stop mechanism by connections comprising a forward extension on the arm 54, a gear segment 78 at the forward end of the arm, and a segmental gear 80 secured to the shaft 76 and meshing with the gear segment 78.

The nature and scope of the present invention having been indicated, and an embodiment of the several features of the invention having been specifically described, what is claimed is:

1. A sewing machine having, in combination, stitch forming devices including a curved hooked needle, a looper lever, a looper lever support, a universal joint connecting the lever and support, mechanism for swinging the looper lever to move its thread carrying end about the needle, and means for moving said support to prevent laying the thread in the hook of the needle during a cycle of operations of the machine.

2. A sewing machine having, in combination, stitch forming devices including a curved hooked needle, a looper lever mounted on a universal joint, mechanism for swinging the looper lever to move its thread carrying end about the needle, and means for moving the looper lever in a direction substantially lengthwise of the needle to prevent laying the thread in the hook of the

needle during a cycle of operations of the machine.

3. A sewing machine having, in combination, stitch forming devices including a
5 curved hooked needle, a tubular looper lever provided with a ball-shaped bearing, a support provided with a cooperating socket, mechanism for swinging the lever to move
10 its thread carrying end about the needle, and means for moving said support to prevent laying the thread in the hook of the
needle during a cycle of operations of the machine.

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

ALFRED R. MORRILL.

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