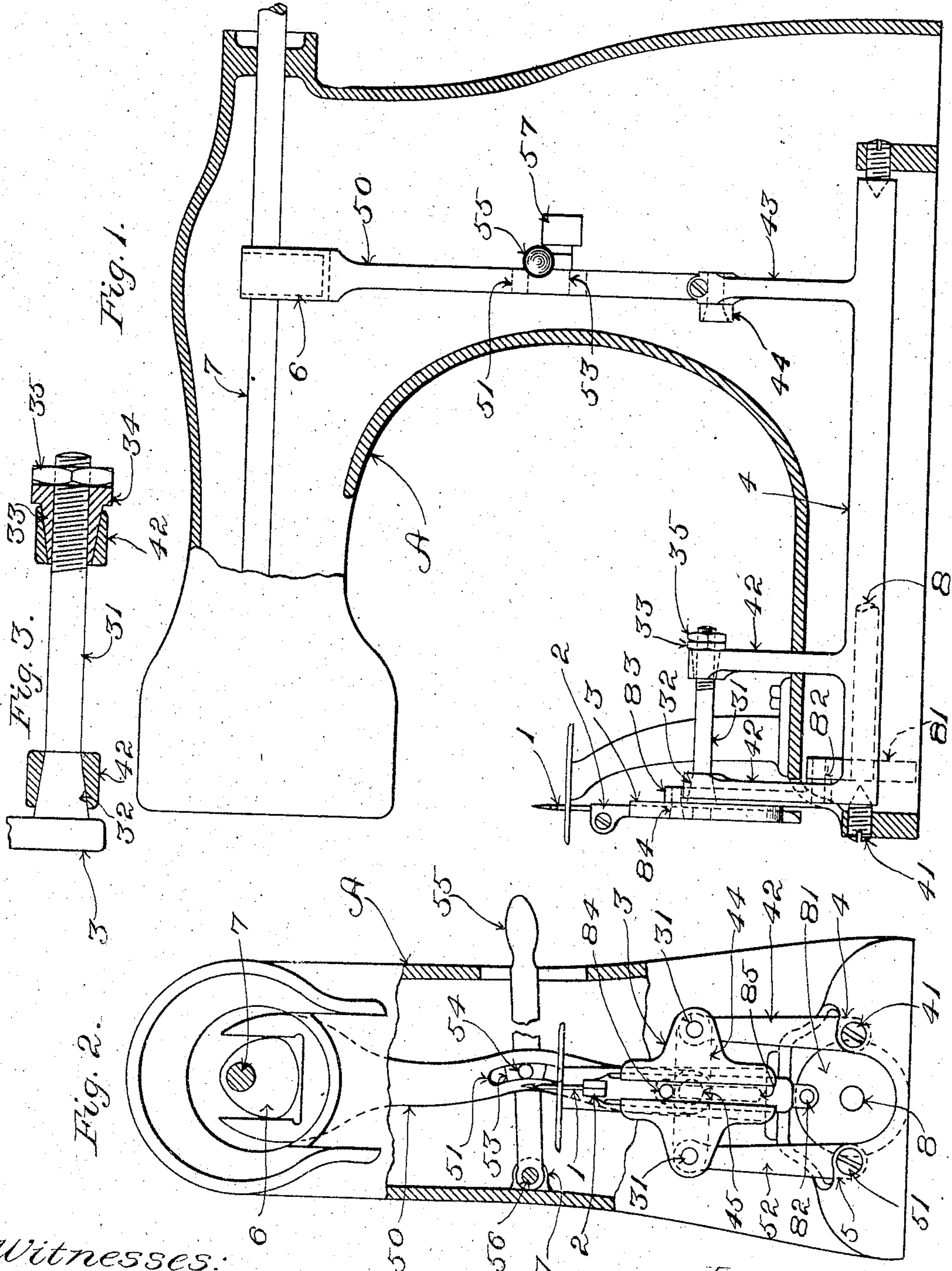


No. 786,909.

PATENTED APR. 11, 1905.

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FEED MECHANISM FOR SEWING MACHINES.

APPLICATION FILED JUNE 25, 1904.



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# UNITED STATES PATENT OFFICE.

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## FEED MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 786,909, dated April 11, 1905.

Application filed June 25, 1904. Serial No. 214,089.

*To all whom it may concern:*

Be it known that I, FRANK W. MERRICK, a citizen of the United States, residing at Boston, in the county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Feed Mechanisms for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention has relation to feed mechanism for sewing-machines, and more particularly to awl-feed or needle-feed mechanisms on the order of those which are employed in hook-needle wax-thread sewing-machines. Ordinarily a feed mechanism of this order is provided with a feed-post mounted with capacity to swing about a pivotal axis, the said feed-post having guides within which the awl-bar or needle-bar is reciprocated endwise in well-known manner to cause the awl or needle to enter the stock or material which is being stitched and withdraw therefrom. For the purposes of the feed the said feed-post is caused to swing about the said pivotal axis in the direction of the feed, while the awl or needle remains entered within the said stock or material, so as to advance the stock or material by reason of the engagement of the awl or needle therewith. The swinging movement of the feed-post about a pivotal axis has the drawback or disadvantage that thereby the awl or needle is caused to change its angle or inclination with respect to the vertical while within the stock or material in consequence of entering the latter at an angle or inclination and being swung into a vertical position before being withdrawn, or vice versa. This change in the angle or inclination of the awl or needle while occupying the hole which has been pierced through the stock or material being stitched operates to enlarge or distort the said hole as well as to spring or bend the awl or needle. The enlargement or distortion of the hole in the stock or material mars the appearance of the finished work. The springing or bending of the awl or needle results frequently in breakage thereof. When working with a long feed upon material of considerable thickness in two or more layers lying one upon the other, the change in the angle

or inclination of the awl or needle which is incident to the swinging movement thereof in the feed movement frequently causes one layer of the said material to advance more rapidly than another, thereby producing a displacement of one layer with relation to another in the direction of the length of the layers, so that their latter ends do not come out even.

The object, in general, of the invention is to produce a feed mechanism which shall possess all of the advantages of the pivotally-mounted feed-post, while free from the disadvantages of the latter when arranged as heretofore.

More specifically, a main object of the invention is to provide improved means for causing the awl or needle in effecting the feed to remain parallel with the path of its endwise movement.

The invention in the best form of embodiment which I have thus far devised is represented in the accompanying drawings, in which—

Figure 1 shows, partly in front elevation, but mainly in vertical section, portion of a sewing-machine having applied thereto an embodiment of the invention. Fig. 2 is an end elevation thereof looking from the left-hand side in Fig. 1, partly sectional. Fig. 3 is a partly-sectional detail showing chiefly the adjustable bearings in connection with the cross-head and its supports upon the rockers.

Having reference to the drawings, the fixed casing of a sewing-machine is shown at A. For convenience I have illustrated a needle-feed mechanism, although the invention is equally applicable in the case of an awl-feed mechanism. A hooked needle of usual character is represented at 1, and 2 is the needle-bar. The needle-bar is fitted between guides of usual character that are provided upon a cross-head 3. The said cross-head fulfils the functions of the usual feed-post. To the needle-bar 2 endwise movements between the said guides are communicated by actuating mechanism of suitable character, and thereby the needle is caused to enter and withdraw from the stock. The mechanism shown in the drawings may or may not be employed, as preferred, the same consisting of a rotating shaft 8, of which only a portion is represented, a

disk 81 on one extremity of the said shaft, a crank-pin 82, carried by the said disk, and a link 83, joining the said crank-pin with a pin 84, projecting from the needle-bar through a vertical slot 85 in the cross-head. In the case of an awl-feed mechanism an awl and awl-bar will be substituted in lieu of the needle and needle-bar. For the purpose of supporting the cross-head, communicating transverse feed movements thereto, and controlling its position during the movements which are communicated thereto I employ a pair of rockers, which respectively are designated 4 and 5. The cross-head 3 is connected pivotally, as by studs 31 31, projecting laterally therefrom, to arms 42 52 of the said rockers. To guard against lateral tipping of the cross-head and to support it steadily at all times during operation, as well as prevent cramping or binding and wear at the pivotal connections, each rocker is provided with two of the arms 42 or 52, (see Figs. 1 and 3,) the two arms of each rocker being separated from each other by a short distance in the direction of the length of the rockers and both of such arms being furnished with bearings, to which the corresponding stud 31 is fitted. The bearings are interiorly tapering, as shown best by Fig. 3, and the studs are shown furnished with cones 32 33 to fit the tapered bearings, the right-hand cone 33 of each stud being longitudinally adjustable upon the stud. The said adjustment is provided for by screw-threading the free extremity of the stud and interiorly threading the cone 33 to fit the said screw-threaded extremity, a check-nut 35 being applied to prevent accidental loss of adjustment. This capacity of the cone 33 for adjustment enables a proper fit of the cones and bearings of the stud to each other to be secured and in addition to enable wear to be taken up. The axes of the rockers are parallel with each other. Those of the studs 31 are equidistant from and parallel with the axes of the respective rockers and also are located at the same distance apart as the latter. It will therefore be apparent that the rockers constitute parallel-motion connections for the cross-head in which the needle-bar or awl-bar moves, operating on the principle of parallel links to keep the needle-bar or awl-bar parallel with the path of its endwise movements at all times during the feed movements. For the purpose of occasioning the feed movements of the needle or awl the rockers are vibrated in unison about their axes by means of motion-transmitting connections which are combined therewith. I have shown for the purpose the rockers as provided at their right-hand extremities in Fig. 1 with arms 43, the latter arms of the two rockers being connected with each other by a link 44, which is shown in Fig. 2 by dotted lines. To the said link is pivoted at 45, Fig. 2, the lower extremity of

a suitable feed-lever 50, the latter having a forked upper extremity which fits a cam 6, that is fast upon the main or driving shaft 7 of the machine to which the invention is applied. Only a portion of shaft 7 is represented in the drawings. Lever 5 is slotted longitudinally at 51, Fig. 2, through an intermediate portion of its length, and within the slot is received a block 53, the latter capable of swiveling upon a pivot-pin 54, which is carried by a lever 55. The said lever 55 is pivotally mounted at 56 upon a portion 57, Fig. 1, of the fixed framework. It constitutes an adjustable fulcrum-support for the feed-lever. By the rotation of the cam 6 the feed-lever 50 is vibrated about the pivot at 54, and through the connection between the lower extremity of the feed-lever and the link 44, joining the arms 43 43 of the rockers, the latter are vibrated, thereby producing the feed movements. To adjust the extent of the latter, the lever 55 is swung around its pivot at 56, thereby moving the pivot 54 so as to vary the relative length of the upper and lower arms of the feed-lever, as will be well understood by those who are skilled in the art.

As already has been indicated herein, the invention is equally as applicable in the case of an awl-feed mechanism as in that of a needle-feed mechanism. For the purposes of the invention the awl and needle are equivalents. Therefore, although in order to avoid alternativeness of expression I make reference to only the needle in my claims, I regard a feed mechanism in which the awl is the immediate element which acts to advance the stock or material being stitched as embraced fully within the scope of the invention that is covered by the claims.

I claim as my invention—

1. In a feed mechanism for sewing-machines, the combination with the needle, its bar, and the cross-head having the guides for the said bar, of the parallel rockers constituting swinging supports for the said cross-head, and means to communicate feed movements to the said parts.

2. In a feed mechanism for sewing-machines, the combination with the needle, its bar, and the cross-head having the guides for the said bar, of the parallel rockers constituting swinging supports for the said cross-head, a link connecting the said rockers, a feed-lever engaging the said link, and actuating means for the said feed-lever.

3. In a feed mechanism for sewing-machines, the combination with the needle, its bar, and the cross-head having the guides for the said bar, and provided with the studs projecting laterally therefrom, of the parallel rockers constituting swinging supports for the said cross-head each having separated bearings for the corresponding stud, and means to communicate feed movements to the said parts.

4. In a feed mechanism for sewing-machines,  
the combination with the needle, its bar, and  
the movable guide for the said bar, of parallel-  
motion links connected with said movable  
5 guide and constituting swinging supports  
therefor, and means to communicate feed  
movements to the said parts.

In testimony whereof I affix my signature in  
presence of two witnesses.

FRANK W. MERRICK.

Witnesses:

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