

(No Model.)

F. H. RICHARDS.
SEWING MACHINE.

No. 558,663.

Patented Apr. 21, 1896.

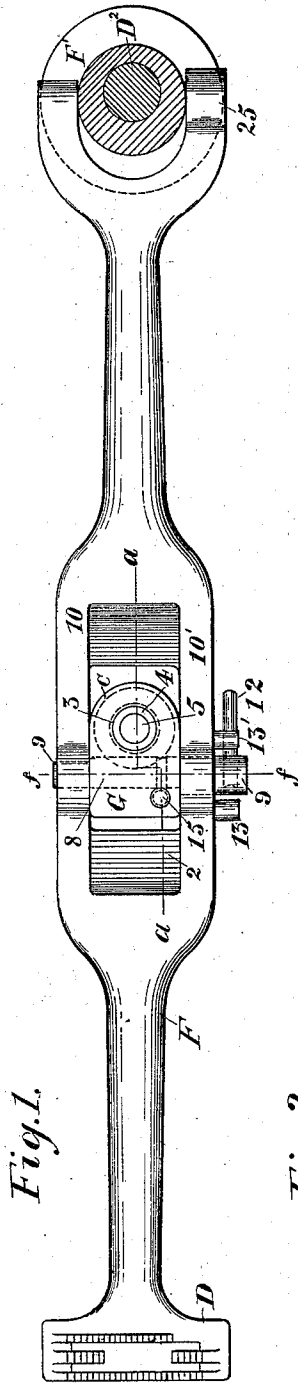


Fig. 1.

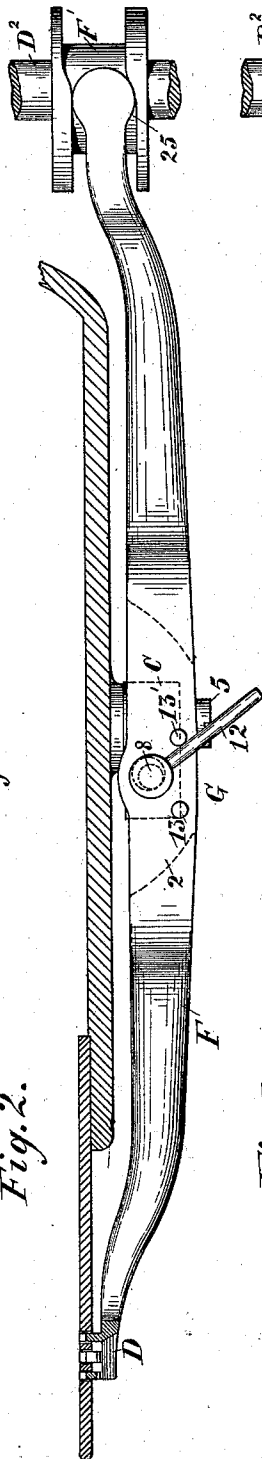


Fig. 2.

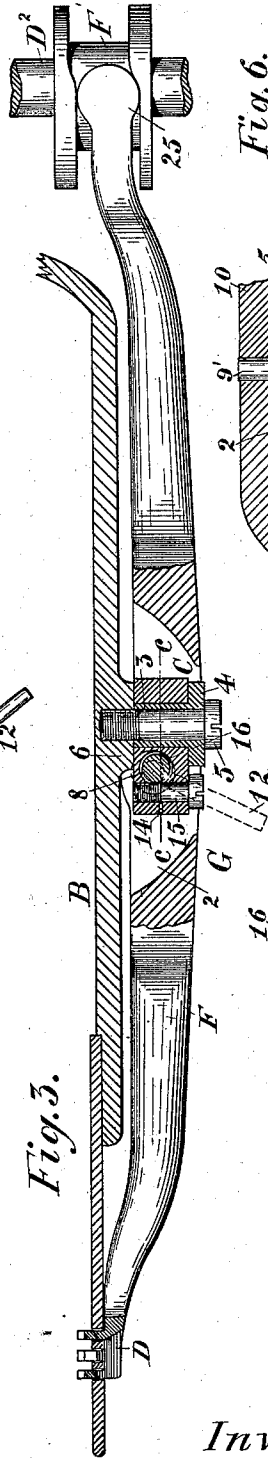


Fig. 3.

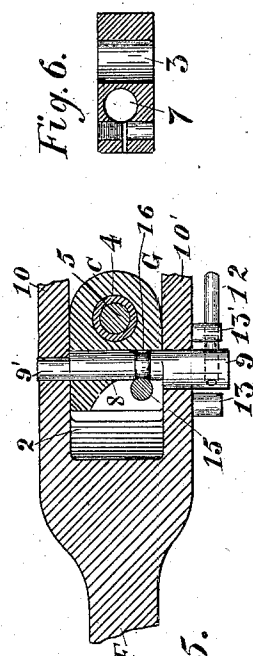


Fig. 4.

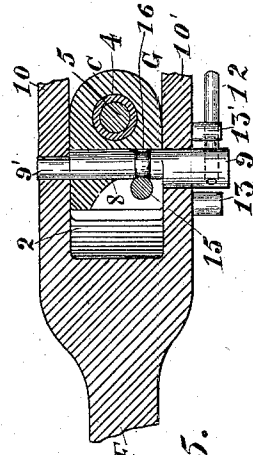


Fig. 5.

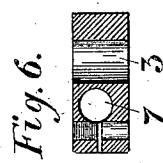


Fig. 6.

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UNITED STATES PATENT OFFICE.

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SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 558,663, dated April 21, 1896.

Application filed March 27, 1895. Serial No. 543,365. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

This invention relates to feed mechanisms for sewing-machines, and more particularly appertains to the carrying and adjusting devices for the feed-levers of such mechanisms.

The object of my present invention is, primarily, to provide, in connection with a sewing-machine feed, an improved feed-lever adapted for vertical and horizontal oscillation; and also to provide, in connection with said feed-lever, an improved feed-lever carrier, and a simple and effective feed-lever adjusting device adapted to be operated, even while the parts are in motion, to raise or lower the feed-lever fulcrum relatively to the throat-plate of the machine with which the feed mechanism is employed, and thereby change the effective operation of the feed-lever and adapt the same for operation upon fabrics of different thicknesses; also to so construct and organize the feed-lever, the feed-lever carrier, and the feed-lever adjusting device that they may be readily assembled and disassembled, and whereby the adjusting device may be operated to effect a change in the operative position of the feed-lever without effecting any material change in the operative relation of the feed-lever and its actuator.

In the drawings accompanying and forming part of this specification, Figure 1 is a plan view of a portion of a sewing-machine feed mechanism embodying my present invention, the bed of the sewing-machine not being shown in this figure and the feed-lever actuator being shown in cross-section and in operative connection with the feed-lever of the said feed mechanism. Fig. 2 is a front elevation of the feed mechanism as shown in Fig. 1, a considerable portion of the bed and the throat-plate of the sewing-machine with which said mechanism is connected being shown in vertical section. This figure shows the feed-lever in its lowest position relatively to the bed of the machine, or in position for operation upon relatively thin fabric. Fig. 3

is a sectional front elevation, somewhat similar to that shown in Fig. 2, of the feed mechanism, showing the feed-lever in its most elevated position relatively to the bed of the machine, the sectioned portion of the feed-lever being taken in dotted line *a a*, Fig. 1, as seen from the under side in said figure. Fig. 4 is a cross-sectional view taken in dotted line *ff*, Fig. 1, looking toward the right hand of said figure and showing the feed-lever in the position illustrated in Fig. 3. Fig. 5 is a horizontal cross-sectional view taken in dotted lines *c c*, Fig. 3, looking downward in said figure and showing a portion of the feed-lever and the adjusting device thereof; and Fig. 6 is a vertical longitudinal section of the feed-lever carrier detached, said section being taken on a line corresponding with the dotted line *a a*, Fig. 1.

Like characters represent like parts in all the figures of the drawings.

In the drawings only so much of a sewing-machine is shown as is deemed necessary to illustrate the application and mode of operation of my present improvements.

In the preferred embodiment thereof, herein shown and described, my improved sewing-machine feed comprises, in part, a feed-lever carrier C, pivotally supported for horizontal oscillation; a feed-lever F, supported for vertical oscillation relatively to the feed-lever carrier, and having a feed-dog D at one end thereof; an adjusting device (designated in a general way by G) intermediate to said feed-lever and feed-lever carrier and adapted for effecting a vertical adjustment of said feed-lever relatively to said carrier, and a feed-lever actuator F' in operative connection with the opposite end of and adapted for imparting horizontal and vertical oscillation to said feed-lever.

The feed-lever F, which may, in a general way, be of any usual construction, is herein shown vertically and longitudinally recessed, as at 2, near the middle portion thereof, to receive the feed-lever carrier or fulcrum-block C, to which carrier the feed-lever is adjustably fulcrumed. This feed-lever carrier is shown vertically bored, as at 3, to receive a bushing 4, which constitutes the pivot-bearing for said carrier, and through which is extended the vertical screw 5, by means of

which said pivot-bearing is fixedly secured to the bracket 6 of the bed B of the machine, (clearly shown in Fig. 3 of the drawings,) said screw being extended through the bushing or pivot-bearing 4 and is screwed into said bracket 6.

The carrier or fulcrum-block C is shown horizontally and transversely bored, as at 7, at one side of the pivot-bearing, to receive the fulcrum-pin 8, which constitutes, in the form thereof herein shown, an element of the feed-lever-adjusting device G.

In view of the fact that the feed-lever is herein shown directly carried upon the adjusting device G, of which the fulcrum-pin is a component part, and in view of the fact that the fulcrum-pin is carried by the fulcrum-block C, the fulcrum-block and fulcrum-pin will be hereinafter referred to as the "main" feed-lever carrier and "auxiliary" feed-lever carrier, respectively.

The fulcrum-pin or auxiliary carrier G, which adjustably connects the feed-lever and main feed-lever carrier C is shown in the nature of a pin 8, journaled in the main transverse bore 7 of the main carrier, and having eccentrically-disposed trunnions 9 and 9' at opposite ends, respectively, thereof, which are journaled in the side walls 10 and 10' of the feed-lever and constitute the fulcrum for said feed-lever.

One of the trunnions, as 9, projects beyond the outer face of the feed-lever, and is shown provided with a laterally-projecting arm 12, which constitutes an actuator for and by means of which the auxiliary feed-lever carrier may be partially rotated to effect a vertical adjustment of the feed-lever fulcrum relatively to the main carrier C, stop abutments 13 and 13' being provided, in connection with the feed-lever, for limiting the throw of the auxiliary-carrier actuator, as will be readily understood by reference to Figs. 1 and 2 of the drawings.

As a means for clamping the auxiliary feed-lever carrier or fulcrum-pin, to prevent accidental movement thereof after adjustment, the bearing 7 of the main carrier, in which said fulcrum-pin is journaled, is slotted or divided at one side thereof, as shown at 14, to form resilient walls, and a clamp-screw 15 is extended through one of these walls and is screwed into the adjacent wall to draw said walls together, which consequently reduces the diameter of the bearing 7 and sufficiently impinges the fulcrum-pin to prevent accidental movement of said pin, as will be readily understood by reference to Fig. 3 of the drawings. This clamp-screw 15 also constitutes a key for preventing longitudinal movements of the fulcrum-pin, said fulcrum-pin being peripherally grooved, as shown at 16, and the shank of said screw engaging in said groove, as will be seen by reference to Fig. 5 of the drawings. This forms a simple and convenient means for locking the fulcrum-pin against longitudinal movement and

for facilitating the assembling and disassembling of the parts.

In Fig. 2 of the drawings the feed-lever fulcrum is shown in its lowest position relatively to the main feed-lever carrier, or in a position which best adapts the feed-lever for operation upon relatively thin material, and in Fig. 3 the feed-lever fulcrum is shown in its highest position, or in a position which best adapts the feed-lever for operation upon relatively thick material.

When it is desired to effect an adjustment of the feed-lever, or to shift the same, for instance, from the position shown in Fig. 2 to the position shown in Fig. 3, it is simply necessary to shift the actuator 12 from the position shown in full lines in Fig. 2 to the position shown in dotted lines in Fig. 3, which partially rotates the fulcrum-pin and shifts the trunnions or fulcrum of the feed-lever from their lowest to their highest positions, as will be understood by a comparison of said Figs. 1, 2, and 3.

The feed-dog D is herein shown formed integrally with the forward end of the feed-lever; but it will be obvious that this construction might be modified without departure from my invention.

In the form thereof herein shown the actuator F' for the feed-lever is in the nature of a feed-cam, having vertically and horizontally disposed cam-faces, engaged by the bifurcated end 25 of the feed-lever F, and adapted for imparting vertical and horizontal oscillations to said feed-lever. This feed-cam will usually be carried upon a vertical shaft D², which constitutes a part of the driving mechanism (not fully shown) of the machine.

It will be obvious that any suitable actuator may be employed, in connection with the feed-lever, without departure from my invention.

Having thus described my invention, I claim—

1. In a sewing-machine, the combination with the bed-plate thereof, of a feed-lever having a vertical, carrier-receiving opening near the middle portion thereof; a feed-lever carrier located in the carrier-receiving opening of the feed-lever; a vertically-disposed pivot extending through said carrier and fixed to the bed of the machine; a horizontally-disposed fulcrum-pin journaled at opposite ends in the two side walls of the feed-lever, and having an eccentrically-disposed middle portion journaled in the horizontal bearings in the feed-lever carrier; means for rotatively adjusting the fulcrum-pin to raise or lower the feed-lever relatively to the carrier; and means for clamping the fulcrum-pin to hold the same in its adjusted position.

2. In a sewing-machine, the combination with the bed-plate thereof, of a feed-lever supported for vertical and horizontal oscillation, and having a vertical, longitudinal carrier-receiving opening near the middle portion thereof; a feed-lever carrier located be-

tween the side walls of the carrier-receiving opening of the feed-lever, and having a vertically-disposed pivot-bearing, and also having at one side of its vertical pivot-bearing a horizontal fulcrum-pin-receiving bearing, one side wall of which is horizontally divided; a vertically-disposed carrier-supporting pivot extending through the pivot-bearing of the carrier and fixed to the bed of the machine; a fulcrum-pin journaled at its opposite ends in the two side walls of the carrier-receiving opening of the feed-lever, and having an eccentrically-disposed middle portion journaled in the horizontal fulcrum-pin-receiving bearing in the carrier; means carried by, and adapted for rotatively adjusting, the fulcrum-pin to raise and lower the feed-lever relatively to the carrier; and a clamp-screw extending through the one, and having a screw-threaded bearing in the other, in the divided parts of the fulcrum-pin bearing, and adapted for clamping the fulcrum-pin in its adjusted position.

3. In a sewing-machine, the combination

with the bed-plate thereof, of a vertically-recessed feed-lever; a feed-lever carrier located between the side walls of the recess of said feed-lever, and pivotally supported for horizontal oscillation, and said carrier having a horizontally-divided fulcrum-pin bearing at one side of the pivotal support; a vertically-disposed pivot fixed to the bed and pivotally supporting said feed-lever carrier; a fulcrum-pin journaled at opposite ends thereof in the side walls of the feed-lever, and having an eccentrically-disposed peripherally-grooved middle portion journaled in the divided bearing of the carrier; a clamp-screw extended through one wall, and having a screw-threaded bearing in the other wall of the divided fulcrum-pin bearing, and engaging the walls of the peripheral groove in the fulcrum-pin, whereby said fulcrum-pin is held against longitudinal and rotative movement.

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Witnesses:

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