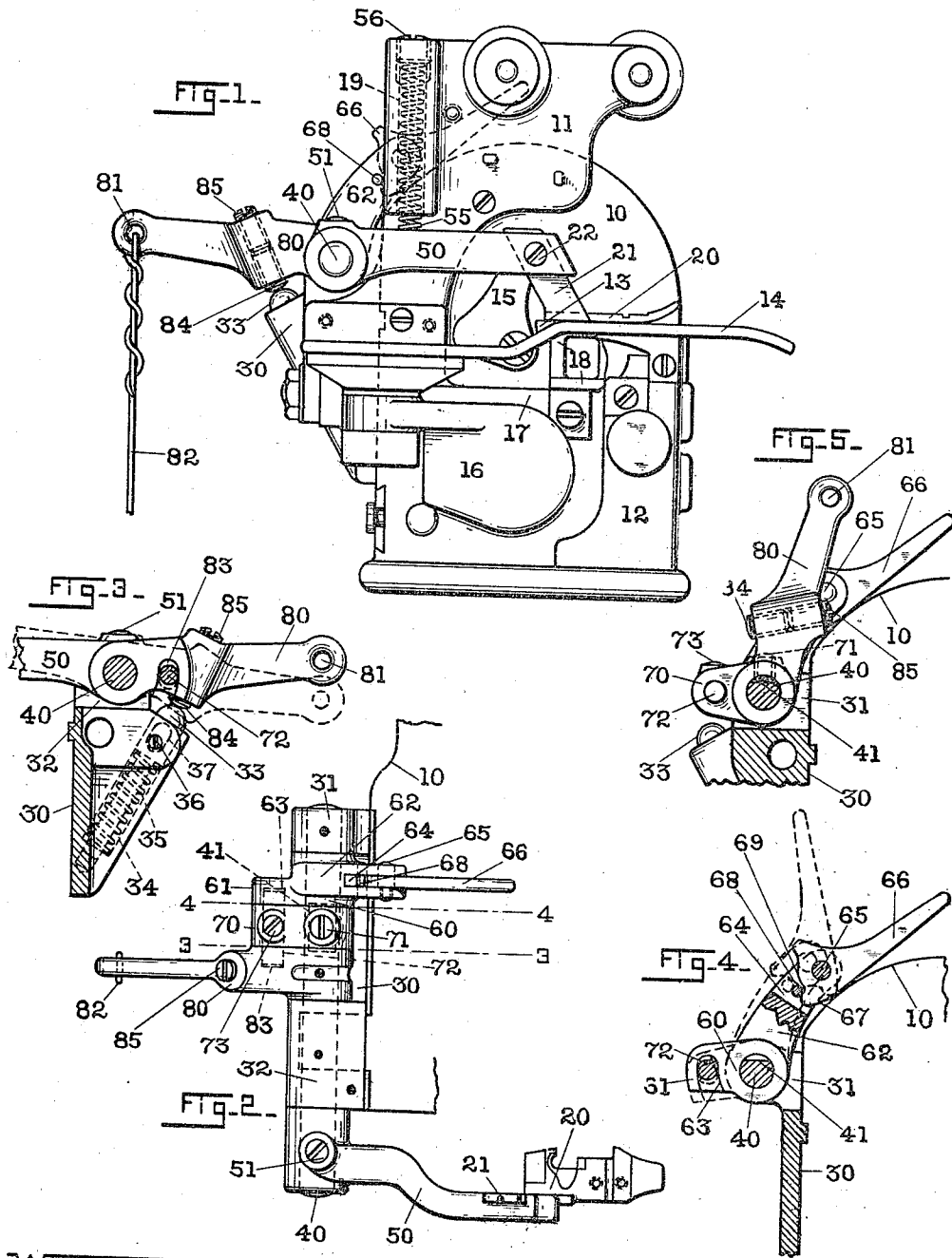


W. H. STEDMAN.
 PRESSER FOOT LIFTING MECHANISM FOR SEWING MACHINES.
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UNITED STATES PATENT OFFICE.

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PRESSER-FOOT-LIFTING MECHANISM FOR SEWING-MACHINES.

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To all whom it may concern:

Be it known that I, WILLIAM H. STEDMAN, a citizen of the United States, residing in the city and county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Presser-Foot-Lifting Mechanism for Sewing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, and to the characters of reference marked thereon.

This invention relates to devices for supporting and raising the presser feet in sewing machines, and the object is to provide a simple and compact mechanism by means of which the presser foot may be raised either by the hand or by the foot or knee.

A further object is to provide mechanism of such construction that otherwise projecting parts may be readily arranged for convenience in shipping the machine to which they are applied.

The invention consists in the provision of mechanism and combinations of devices and arrangements as hereinafter fully described and claimed.

An embodiment of this invention is illustrated in the annexed drawings, in which it is shown in connection with a machine of the Merrow overseaming type, but it is not the intention to restrict the invention to this particular type of machine.

In the drawings: Figure 1 is an elevation, showing an embodiment of the invention in connection with a partially illustrated sewing machine. Fig. 2 is a plan view of much of the said mechanism, the sewing machine being partly outlined in connection therewith. Fig. 3 is a view in section and elevation, the section being taken on the line 3-3 of Fig. 2 and the parts illustrated as viewed in the opposite direction from that in which they are viewed in the Fig. 1. Fig. 4 is a sectional view and shows also in connection with the mechanism a portion of the machine frame in outline. Fig. 5 is a view similar to the Fig. 4 but with the mechanism as arranged for shipment.

Like reference characters throughout the several figures of the drawings denote the same parts.

The reference number 10 indicates the

frame of the machine, 11 the head, 12 the needle plate support, 13 the needle plate, 14 the work plate, 15 the needle carrier, 16 the feed cover inclosing part of the feeding mechanism, 17 the feed carrier and 18 the feed dog mounted on the carrier and adapted to be projected up through the needle plate to engage and feed the goods resting thereon and on the work plate, the general character and operation of this type of machines being well understood.

The presser foot is indicated by the number 20 and is held normally downward upon the needle plate or upon the material that may be thereon. Said presser foot, or more properly an arm 50 carrying the foot is pivotally supported at a point in the rear of the frame 10. This support is formed by a bracket 30 secured to the rear of the frame 10 and having two bearings 31 and 32, although the bearings could be integral with the frame 10. Bearings 31 and 32 support a rocker shaft 40 upon which, and outside the bearing 32 the forwardly extending arm 50 is secured by a set screw 51. Arm 50 is preferably channeled near its forward end to receive the upwardly extending shank 21 of the presser foot, which shank is held in the channel by the screw 22. The presser foot is yieldingly held normally downward or toward the needle plate by a spring 55, located in a chamber 19 of the head 11 and pressing upon the presser foot arm 50, while a screw 56 in the chamber 19 at the upper end of the spring provides a means to adjust the tension of the spring.

Located on the shaft 40 between the bearings 31 and 32 are three levers 60, 70, 80 of which the levers 60 and 80 are respectively adjacent the bearings 31 and 32 and the lever 70 intermediate the levers 60 and 80. The lever 70 extends rearwardly horizontally from the shaft 40 to which it is secured by a set screw 71, while levers 60 and 80 are loosely mounted on the shaft 40 and respectively are adapted to be actuated indirectly by the hand and foot of the operator to effect, through engagement with the lever 70, the rocking of the shaft 40 and thus the raising of the presser foot. The lever 70 carries a pin 72 near its outer end and preferably held by a set screw 73. The pin extends parallel with the shaft 40 and projects at its opposite ends into the path of move-

ment of a portion of the lever 60 on the one side and into the path of movement of a portion of the lever 80 on the other side of the lever 70. This construction permits of the use of a single pin 72 held by a single set screw. The shaft 40 is normally held against endwise movement by the levers which occupy all the space between the bearings, but may be adjusted longitudinally to position the presser foot laterally after loosening the screw 71 which secures the lever 70 thereto. Shaft 40 is preferably provided with a flat spot 41 for the engagement of the screw 71 to prevent rotation of the shaft while lateral adjustment of the presser foot is being made.

The lever 60 is preferably of angle lever form, having two arms 61 and 62, the former of which is located in proximity to the lever 70, and is provided with a recess or groove 63 preferably concentric with the shaft 40 for the reception of the projecting end of the pin 72. The arm 62 extends in a general vertical direction, or somewhat forwardly inclined, and at its upper end it is preferably bifurcated or slotted as at 64 for the reception of a cam lever 66 pivoted on pin 65, whereby the presser foot may be raised by hand. The pivotal end of the cam lever 66 has a cam surface 67, adapted to ride on the frame 10, or any suitable fixed surface, as best shown in the Fig. 4. When the presser foot is down the lever 66 rests normally against the frame 10 with its free end projecting upwardly and toward the operator. Backward movement of the lever 66 upon its pivot 65 causes cam surface 67 to ride upon the frame 10 and forces the end of the arm 62 rearwardly as indicated in dotted lines in the Fig. 4, whereby the end wall or shoulder of the recess 63 is caused to engage the pin 72 to rock the lever 70 and rocker shaft 40 to which it is secured, and through the rocker shaft and the arm 50 carried thereby raise the presser foot against the pressure of spring 55. When the lever 66 is thrown back to the position shown in the Fig. 4 in dotted lines, the high point of the cam surface 67 resting on the machine frame will be carried slightly past the point at which the presser foot will have been raised to its highest position and therefore the lever 66 and the presser foot through connections therewith will be retained in a raised position even upon the removal of the hand of the operator as downward pressure of the presser foot will have a tendency to crowd the cam surface 67 forward and the upper end of the lever 66 backward which movements would be prevented by the stop 68. Upon again rocking the lever 66 forward from the position shown in dotted lines, the spring 55 is free to act and return the presser foot and the several hand lifting elements to their respective normal

positions. The rocking movement of the lever 66 is limited in each direction by a pin 68 in the arm 62 with which the end walls of the notch 69 in the lever engage, as will be understood. The notch 69 may be made more or less limited even to the point of preventing any independent motion of the lever 66 which would be practically equivalent to making the lever 66 integral with its supporting lever 60 in which construction the presser foot would not remain lifted when the lifting force is removed from it. In adjusting the lever 60 there is a little space between the end of the recess 63 and the pin 72 as shown in the Fig. 4, for a purpose hereinafter explained in connection with the action of the lever 80. The lever 80 when in position for use, extends horizontally rearwardly from the machine and near its outer end has an eye 81 for a wire 82 or other suitable connection adapted to extend to a foot treadle in any well known manner. At its side adjacent the lever 70, the lever 80 has a groove or recess 83 similar to the recess 63 in the lever 60. The end of the pin 72 of the lever 70 extends into the recess 83 and when the lever 80 is rocked downwardly through the wire 82 upon the manipulation of the foot treadle the end wall or shoulder of the recess 83 engages the pin 72, whereby rocking motion is imparted to the lever 70, the shaft 40 and the arm 50 carrying the presser foot 20, to raise the presser foot against the force of the spring 55. Upon the release of the lever 80 the spring 55 returns the presser foot to its normal position. The lever 80 is yieldingly supported in its normal position and returned to such position after having been rocked downwardly and released, by a spring actuated plunger 33 located in a chamber 34. The spring 35 is shown in dotted lines in Fig. 2 and preferably encircles the stem of the plunger, being confined between the head of the latter and bottom of the chamber 34. To retain the plunger in its chamber a set screw 36 may be located in the bracket 30, with its inner end entering a recess or opening 37 in the plunger (dotted lines in Fig. 3) the said recess being of sufficient length to permit of the necessary longitudinal movements of the plunger. The lever 80 preferably does not contact directly with the end of the plunger, but has a set screw 84 bearing on the plunger and itself checked by a screw 85 also located in the lever 80. Upon the proper manipulation of the screws 84 and 85 the lever 80 may be so adjusted relatively to the plunger 33 that when the screw 84 rests upon the plunger, in the normal position of the lever 80, there is a little space between the end of the recess 83 and the pin 72, as shown in the Fig. 3. Furthermore, the plunger 33 is made of such length at its smaller end, and at its

upper or larger end projects sufficiently to permit the lever 80 to depress the plunger, so that its smaller end strikes the bottom of its chamber and acts as a stop for the plunger and the lever 80, thus determining the height to which the presser foot may be lifted by the lever 80, which height is also adjustable by the manipulation of the screw 84 and its check screw 85.

When the presser foot is raised either by the hand or by the foot operated means, there is at first a little lost motion to be taken up before the foot is actually raised, whereby the slight intermittent oscillation of the lever 70 caused by the intermittent movements of the feed dog transmitted thereto through the presser foot and the shaft 40 will not be communicated to the hand and foot operating devices. The lever 80 being loosely mounted on the shaft 40 may be swung on said shaft from its rearwardly extending position which it occupies when the machine is in use, into an upward position as shown in Fig. 5, for convenience in packing for shipment, a machine provided with the improved presser foot lifting mechanism.

Having thus described my invention, what I claim, is:

1. In combination in a sewing machine, presser foot mechanism including a presser foot, a rocker shaft, a connection between the shaft and the foot, means for supporting the rocker shaft, two independently movable levers loosely supported on the rocker shaft, a lever fixed on the shaft and having projections extending into the paths of movement of the two loose levers whereby the movement of either loose lever may effect the raising of the presser foot and a spring to lower the presser foot.

2. In combination in a sewing machine, presser foot mechanism comprising a presser foot, a rocker shaft pivotally supporting the presser foot, means for supporting the rocker shaft, two independently movable devices for raising the presser foot, a lever on the rocker shaft adapted to be engaged by either of the devices to effect the raising of the presser foot and a spring for lowering the foot.

3. In combination in a sewing machine, a presser foot, a rocker shaft pivotally supporting the presser foot, means for supporting the rocker shaft, two levers loosely supported on the rocker shaft, a lever secured on the shaft between the two loose levers, the fixed lever having a projection at each side extending into the paths of movement of the two loose levers whereby the rocking of either loose lever will effect the raising of the foot and a spring for lowering the foot.

4. In combination in a sewing machine, a presser foot, a rocker shaft pivotally supporting the presser foot, means for sup-

porting the rocker shaft, a lever fixed on the rocker shaft, a pin secured in the lever and projecting at each end beyond the lever, two levers loosely mounted upon the rocker shaft one on either side of the fixed lever the face of each lever next the fixed lever being recessed to receive the adjacent projecting end of the pin whereby upon the rocking of either loose lever the wall of its recess will engage the pin to effect the raising of the presser foot, and means for lowering the foot.

5. In combination in a sewing machine, a presser foot, a rocker shaft for pivotally supporting the said foot, a support for the rocker shaft in which it is rotatably and slidably supported, two levers loosely mounted on the rocker shaft, a lever fixed upon the shaft between the two loosely mounted levers, the shaft being longitudinally adjustable in the fixed lever, projections carried by the fixed lever and lying in the paths of the loosely mounted levers whereby either of the loosely mounted levers may impart motion to the fixed lever to raise the presser foot, a spring to lower the presser foot and means for tensioning the spring.

6. In combination in a sewing machine, a presser foot, a rocker shaft pivotally supporting the presser foot, means mounted on the rocker shaft for raising the presser foot by hand, means mounted on the rocker shaft adapted for connection with a treadle for raising the presser foot, a support for the rocker shaft in which it is longitudinally adjustable to effect the lateral adjustment of the presser foot and a spring for lowering the presser foot.

7. In combination in a sewing machine, a presser foot, a rocker shaft pivotally supporting the presser foot, means for supporting the rocker shaft, a lever fixed on the rocker shaft, two levers each loosely mounted on the rocker shaft and either adapted to be rocked to engage the fixed lever to raise the presser foot independently of the other, a spring for lowering the presser foot, means for tensioning the spring and means for returning one of the levers to its normal position.

8. In combination, in a sewing machine, a presser foot and means for supporting the same, a rocker shaft, means for supporting the rocker shaft, a lever fixed on the rocker shaft, two levers separately and loosely mounted on the rocker shaft each adapted to be rocked to impart motion to the fixed lever to raise the presser foot, a spring for lowering the presser foot, and means for limiting the amount of presser foot movement and means for returning one of the levers to its normal position.

9. In combination in a sewing machine, a presser foot, a rocker shaft pivotally sup-

porting the presser foot, means for supporting the rocker shaft, two levers loosely mounted on the rocker shaft, a lever fixed on the shaft between the two loosely mounted levers and adapted to engage with said two loosely mounted levers, a cam lever, a pivotal connection therefor with one of the loosely mounted levers, a surface against which the cam lever rides, a spring for returning the loosely mounted lever and cam lever to their normal positions and for lowering the presser foot and means for tensioning the spring.

10. In a sewing machine and in combination, presser foot raising mechanism including a rocker shaft and means for its support, a lever fixed to the rocker shaft, two levers independently and loosely mounted on the rocker shaft and adapted to engage the fixed lever and a connection with the presser foot including an arm whereby the presser foot may be raised by rocking either one of the two levers loosely mounted upon the rocker shaft.

11. In combination, in a sewing machine, a presser foot, a rocker shaft forming a pivotal support for the presser foot, a support for the rocker shaft, a lever fixed on the rocker shaft, a lever pivoted loosely on said rocker shaft and adapted to engage the

fixed lever in one direction and to be swung clear of said fixed lever in the opposite direction toward the body of the machine whereby the loose lever is protected from injury and the machine occupies less space for shipment, substantially as shown.

12. In combination in a sewing machine, presser foot mechanism including a rocker shaft, a presser foot pivotally supported thereby, two levers loosely mounted on the rocker shaft, a lever fixed on the rocker shaft and adapted to be actuated by either of the loosely mounted levers to raise the presser foot, and a spring to lower the presser foot.

13. In combination in a sewing machine, a presser foot, a shaft forming a pivotal support for the presser foot, a lever mounted on the shaft and connected to move in unison with the presser foot, a hand operated lever and a foot operated lever mounted on said shaft and movable in one direction independently of the presser foot lever, and means whereby the movement of the hand and foot operated levers in the opposite direction will lift the presser foot.

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Witnesses:

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