

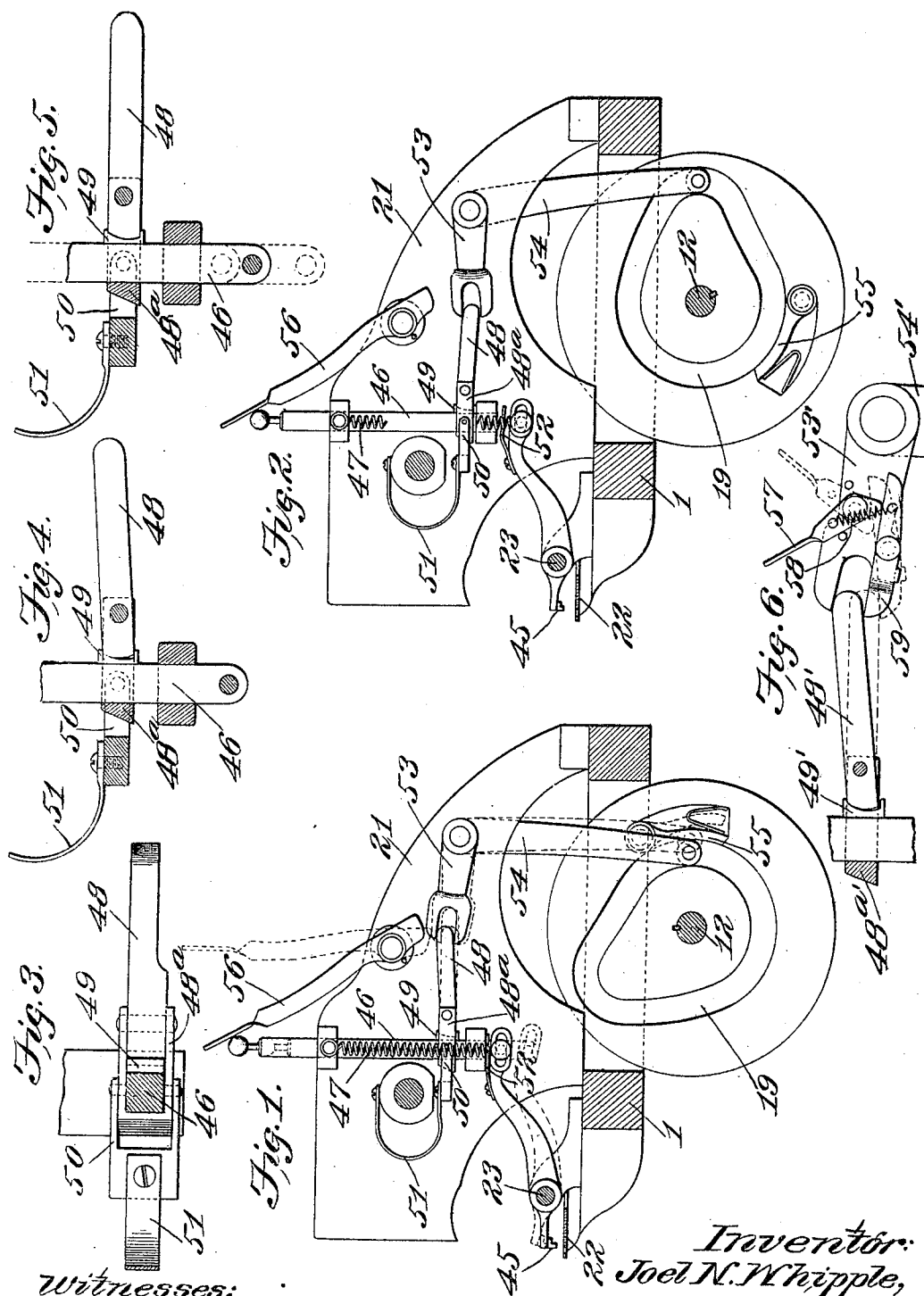
No. 812,159.

PATENTED FEB. 6, 1906.

J. N. WHIPPLE.

PRESSER FOOT AND MECHANISM FOR OPERATING THE SAME.

APPLICATION FILED FEB. 18, 1902.



Witnesses:
G. A. Pennington.
Jules Thome.

Inventor:
Joel N. Whipple,
by Beakwell Cornwall
Attys.

UNITED STATES PATENT OFFICE.

JOEL N. WHIPPLE, OF ST. LOUIS, MISSOURI, ASSIGNOR TO LANDIS MACHINE COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

PRESSER-FOOT AND MECHANISM FOR OPERATING THE SAME.

No. 812,159.

Specification of Letters Patent.

Patented Feb. 6, 1906.

Application filed February 18, 1902. Serial No. 94,597.

To all whom it may concern:

Be it known that I, JOEL N. WHIPPLE, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Presser-Feet and Mechanism for Operating the Same, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view, chiefly in side elevation, of a portion of a sewing-machine provided with my present invention. Fig. 2 is a view of like character, the presser-foot being shown in a different position. Fig. 3 is a top plan view, partly in section, illustrating the clamp used in connection with the bar which operates the presser-foot. Figs. 4 and 5 are detail views of said clamp, and Fig. 6 is a view illustrating a modified form of mechanism for operating and releasing the clamp.

My invention relates to improvements in presser-feet and mechanism for operating the same, and more particularly to presser-foot and operating mechanism for the same adapted to be used in connection with sewing-machines of the type forming the subject-matter of a patent granted December 15, 1903, and numbered 747,284 on an application filed by me.

My object is to provide a presser-foot with operating mechanism of such character that the said foot is raised and lowered automatically, it being possible also to operate the presser-foot manually when so desired.

To these ends and also to improve generally upon devices of the character indicated, my invention consists in the various matters hereinafter described and claimed.

While the present presser-foot and its operating mechanism are particularly adapted for use in the sewing-machine previously mentioned, it will at once be apparent that the same can be employed upon sewing-machines of other types and also that the same can be employed upon machines other than sewing-machines.

Referring now more particularly to the drawings, 1 represents a portion of the frame of the machine. 12 indicates an operating-shaft suitably supported upon said frame and

receiving its motion from any appropriate source, and 21 represents what may be termed the "head-frame" of the machine. A cam 19 is mounted upon the shaft 12 and rotates therewith, and a plate 22 is suitably supported upon the frame of the machine and is adapted to have the work placed upon the same.

23 indicates a shaft suitably supported upon the machine-frame, and 45 indicates a presser-foot pivotally mounted upon the said shaft, the inwardly-extending arm of said presser-foot being slotted to cooperate with a pin on the lower end of a bar 46. This bar 46 is preferably non-circular in cross-section and is slidingly mounted in appropriate lugs or ears extending from the head-frame 21. A spring 47 is connected to the bar 46 in such manner that its energy is constantly exerted to lift said bar and in so doing force the presser-foot 45 down upon the work.

In the operation of certain machines—*e. g.*, in the operation of the sewing-machine forming the subject-matter of my before-mentioned patent, No. 747,284—it is necessary that the presser-foot shall be forced down hard upon the work and held in its working position to hold the said work in position for a time, that said presser-foot shall then release the work in order to permit the same to be fed into position to receive the next stitch, and that the presser-foot shall be self-adjusting for various thicknesses of work. To accomplish the above, I provide a clamp which cooperates with the bar 46 and the spring 47 in such manner that in the operation of the machine said bar is raised by the said spring and lowered by the action of the said clamp, the limit of the upward movement of the bar being determined by the thickness of the work.

48 indicates a cam member in the form of an arm, to the inner end of which is connected a bail 48^a, said bail embracing the presser-bar 46. Between the inner end of arm 48 and the bar 46 is arranged a clamping-block 49 in the form of a saddle, the seat of which receives and cooperates with the end of arm 48, which is preferably curved eccentrically with respect to the pivotal connection between said bar and said bail. By this construction the reciprocation of the presser-bar is provided for in a manner which will be hereinafter de-

scribed. There is a small amount of idle movement of the arm 48 with respect to clamping-block 49, during which idle movement the clamping-block is free—that is, it is not bound against the presser-bar.

50 indicates a bail connected to the bail 48^a and also to the end of a spring 51, whose energy is directed in pulling said bail upwardly and outwardly. One purpose of this spring is to free the presser-bar of the clamp when said presser-bar is manually operated.

The inwardly-extending arm of the presser-foot carries relief-spring 52, which serves as a buffer to cushion the upward movement of said arm.

53 indicates a bifurcated rock-arm mounted on a shaft having a bearing in the head-frame 21, the opposite end of said shaft carrying a depending arm 54, upon whose lower end is arranged a roller fitting in a cam-groove in the cam 19.

55 indicates a yielding wall in the cam-groove which permits the arm 54 to be moved rearwardly to an abnormal position, as shown by dotted lines in Fig. 1, for the purpose of relieving the clamp, so that the presser-bar and presser-foot can be manually operated. In order to hold the bifurcated arm 53 depressed, I arrange a lever 56 thereabove, whose operation may be understood by examining the drawings.

In operation when the bifurcated arm 53 is depressed by the lever 56 the clamping-saddle 49 is relieved from pressure and the presser-bar 46 may be moved up and down by hand. In introducing new work under the presser-foot the bar 46 is depressed and the work arranged in position, after which the bar is released and the presser-foot brought against the work by the spring 47. The lever 56 is now moved to relieve the arm 53, and instantly the spring-pressed wall in the cam 19 causes said arm to be elevated, forcing the clamping-saddle against the bar and locking the bar to the arm. The tendency of the spring 51 is to hold the bail 50 in elevated position. Assuming that the presser-bar has been raised by the spring 47 and that the arm 48 has been thrown into the position illustrated in Fig. 1, the cam-surfaces between the said arm and the clamping-saddle are such that the said saddle is forced against the presser-bar, whereby said presser-bar is locked in its elevated position. The arm 48 occupies the position just described when the roller upon the lever-arm 54 is in the portion of the groove of the cam 19 which lies the least distance from the axis of rotation of said cam. As the cam continues its rotation and the said roller enters and travels in the radial enlargement of said groove the arm 48 is thereby first momentarily brought to its horizontal position, releasing the clamp, and is then rocked downwardly upon its pivotal connection with the bail 48^a, to again clamp the sad-

dle against the presser-bar, this reclamping of the presser-bar being effected soon after the roller is freed from the portion of the cam-groove which lies the least distance from the center of rotation of the cam, and further rotation of said cam serves to swing the arm 48, its clamp, and the presser-bar downwardly against the tension of the springs 47 and 51, as illustrated in Fig. 2. The parts having reached this position, further rotation of the cam causes the roller of the lever-arm 54 to move toward the heretofore-mentioned center of rotation, whereby the rock-arm 53 moves one end of the arm 48 upwardly, and the spring 51, connected to the bail 50, moves the other end of the said arm 48 upwardly, the spring 47 being thus permitted to simultaneously elevate the presser-bar. When the presser-bar reaches the limit of its upward movement by reason of the presser-foot reaching its position firmly engaging the work, continued movement of the cam 19 serves to rock the arm 48 upon its pivotal connection with the bail 48^a until the said arm reaches its horizontal position, whereby the clamp is again momentarily released and the spring 51 raises the bail 50 and the inner end of the arm 48 to fully-elevated position, the outer end of said arm 48 being raised and the clamp thus reclamped upon the presser-bar by the continued movement of the cam 19.

In Fig. 6 I have shown a modified form of a device for permitting the manual operation of the presser-bar, in which form the parts 48', 48^a', 49', and 54' are respectively similar to the before-mentioned arm 48, bail 48^a, saddle-block 49, and arm 54. The lever 53' is generally similar to the before-mentioned lever 53, but has one of its jaws pivoted, said jaw being indicated at 59. A lever 57 cooperates with this jaw, and a spring 58 is designed to force the jaw open when the lever is in one position, and when the lever is in the other position said spring passes the line of centers and locks the lever. There are appropriate stops for limiting the movement of the lever.

In operation, assuming that the parts have stopped in substantially the position illustrated in Fig. 1—i. e., with the presser-foot depressed and the arm 48 raised and causing the presser-bar to be clamped—the lever 56 (or 57) is swung into the position indicated by dotted lines, thus leaving the presser-bar free to be manually depressed and the work is placed in position under the presser-foot, the spring 47 returning the presser-foot to working position as soon as the work has been arranged and the presser-bar released by the operator. The lever 56 or 57, as the case may be, is now thrown into normal position, (illustrated by full lines in Figs. 1 and 6, respectively,) and the arm 48 is then thrown into raised position to effect clamping of the presser-bar, such throwing of the said arm

being effected by the spring-actuated part 55 or 59. While the roller upon the lever-arm 54 is in the portion of the cam-groove here shown as concentric with the center of rotation of the cam 19, the presser-foot is locked
 5 down upon the work, and the work is thus held firmly in position for the proper length of time—*e. g.*, while an awl is being forced up through said work. Further movement of
 10 the cam operates to lift the presser-foot, and during the time that the presser-foot is so lifted the work can be fed in any appropriate manner. After the work has been fed the presser-foot is again operated to grip said
 15 work, the cam and the connections between the same and the presser-foot serving to raise the presser-foot and the spring 47 serving to depress the same at the desired intervals.

I am aware that many minor changes in
 20 the construction, arrangement, and combination of the several parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my
 25 invention.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent, is—

1. The combination with a presser-foot, of a
 30 presser-bar, connection between said presser-foot and presser-bar whereby raising of the latter effects depression of the former and vice versa, a spring 47 tending to raise said presser-bar, a bail 48^a, an arm 48 pivoted to
 35 said bail, a saddle-block 49, a bail 50, a spring 51, and means cooperating with the outer

end of the arm 48 for moving the same and the presser-bar vertically; substantially as described.

2. The combination with a presser-foot, of
 40 a presser-bar to which the same is connected, a clamp on said presser-bar having one member extending rearwardly, a bifurcated arm cooperating with said extended member of
 45 the clamp, a cam for rocking said bifurcated arm, and a yielding wall in said cam; substantially as described.

3. The combination with a presser-foot, of a presser-bar to which the same is connected,
 50 a clamp cooperating with said bar and having a rearwardly-extending member, a bifurcated arm cooperating with said extended member, one of the jaws of said arm being pivoted, and a lever cooperating with said
 55 bifurcated arm to relieve the rearwardly-extending clamp member; substantially as described.

4. The combination with a presser-foot having a rearwardly-extending arm, of a presser-bar having slot connection with said arm,
 60 a buffer on the end of said arm, a clamp cooperating with said presser-bar, and means cooperating with said clamp to move the bar vertically; substantially as described.

In testimony whereof I hereunto affix my
 65 signature, in the presence of two witnesses, this 4th day of February, 1902.

JOEL N. WHIPPLE.

Witnesses:

MARGUERITE SMOOT,
 GALES P. MOORE.