

(No Model.)

3 Sheets—Sheet 1.

H. C. PETERS.
SEWING MACHINE.

No. 541,570.

Patented June 25, 1895.

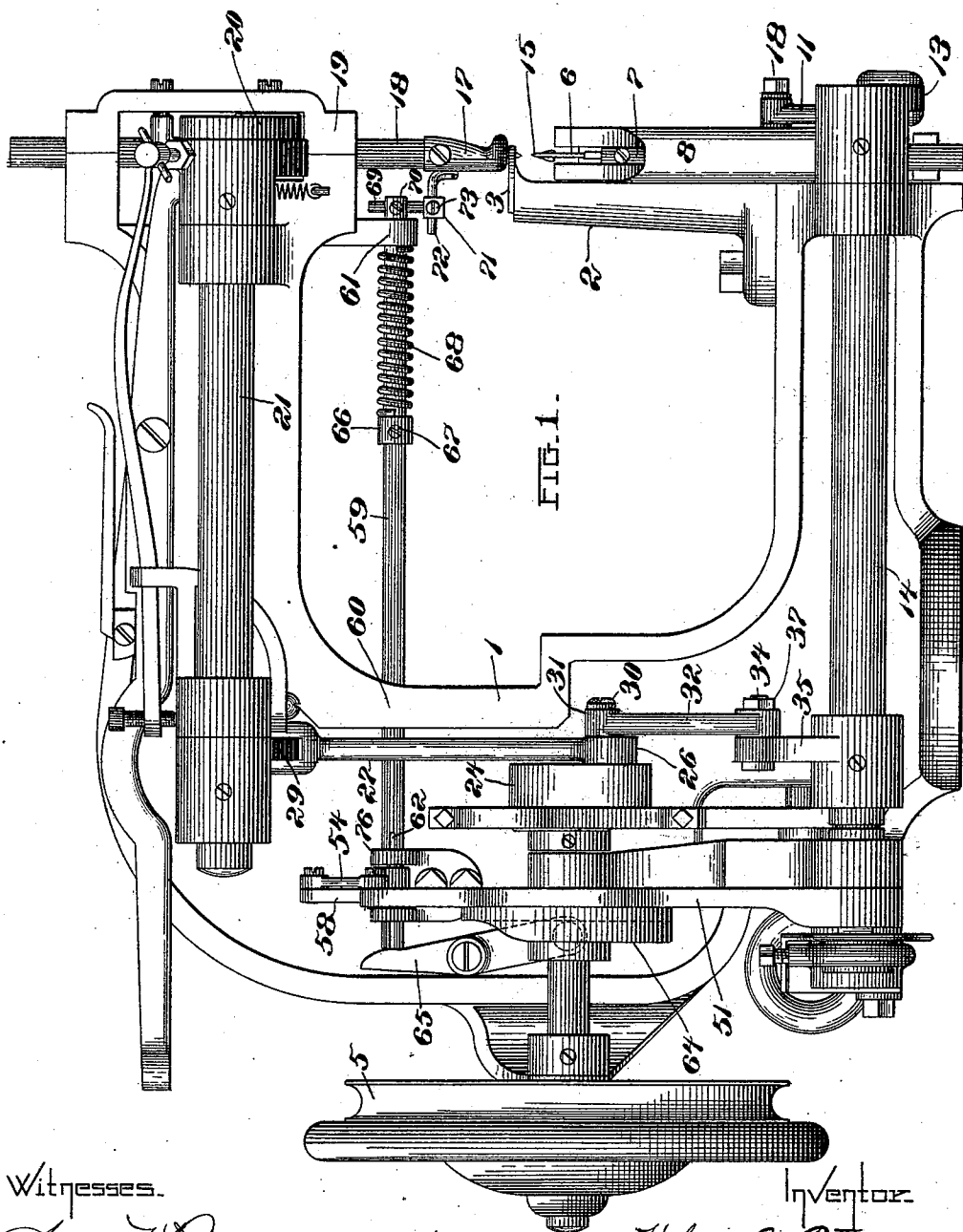


FIG. 1.

Witnesses.

Arthur F. Randall,
Robert Wallace.

Inventor.

Heber C. Peters,
by Macleod Calver Randall,
his Attorney.

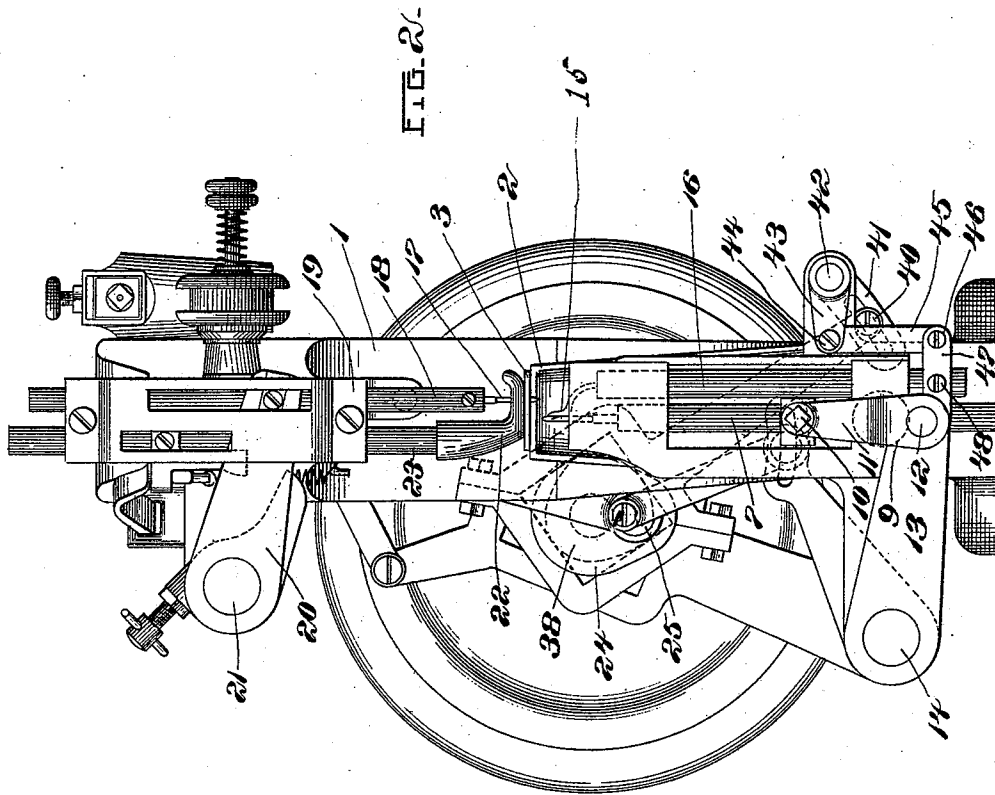
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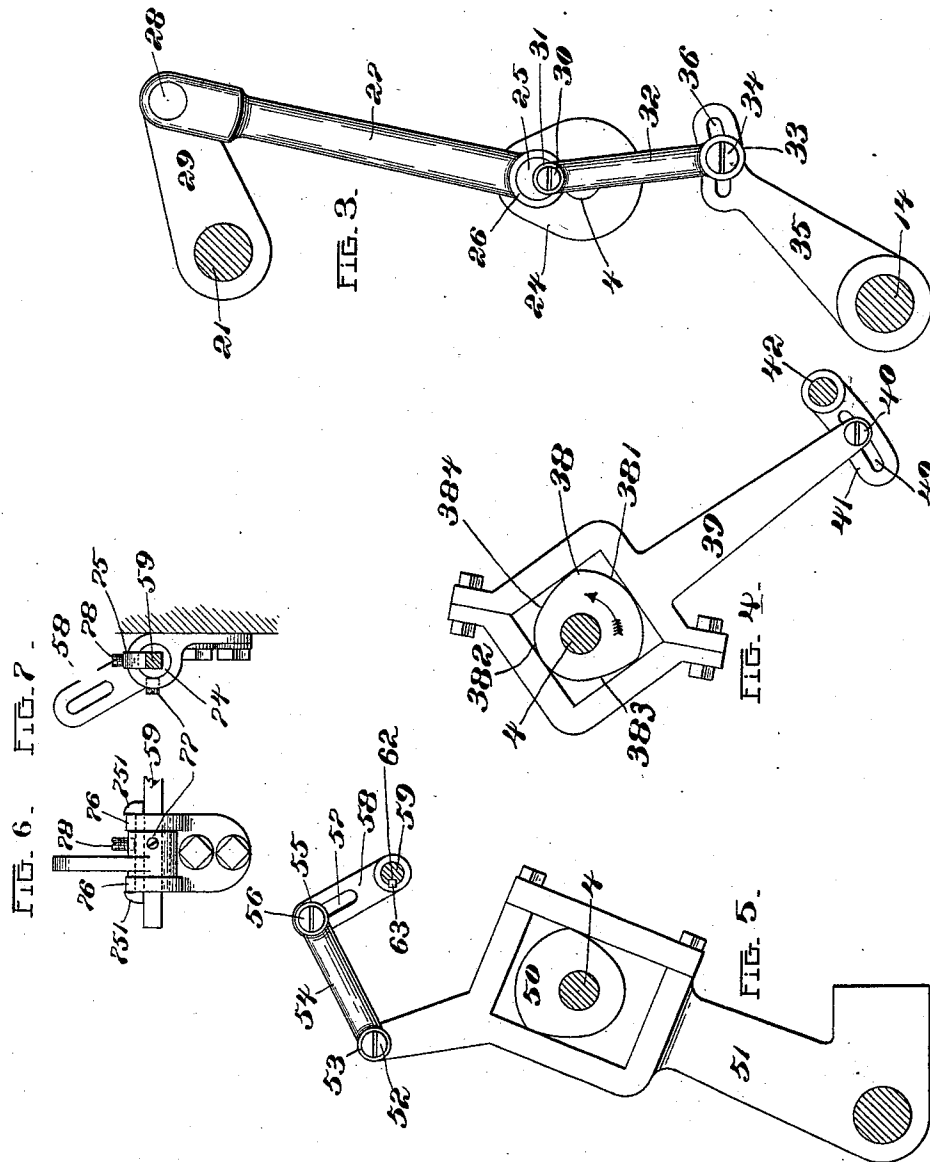
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UNITED STATES PATENT OFFICE.

HEBER C. PETERS, OF BOSTON, MASSACHUSETTS.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 541,570, dated June 25, 1895.

Application filed January 23, 1895; Serial No. 535,871. (No model.)

To all whom it may concern:

Be it known that I, HEBER C. PETERS, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to sewing machines which are used for sewing leather, and more particularly to the devices which are employed in such machines for actuating the cast-off and thread-guide, and also to the construction of the thread guide.

The invention will be fully described first in connection with the accompanying drawings, after which the respective features thereof will be more particularly pointed out and clearly defined in the claims at the close of this specification.

In the drawings, Figure 1 is a view in side elevation of a sewing-machine having my invention applied thereto. Fig. 2 is a view of the said sewing-machine in end elevation, the view being taken from the right hand in Fig. 1. Figs. 3, 4, and 5 are detail views showing certain features of the operating mechanism. Figs. 6 and 7 show a modification.

1 is the frame-work of the machine.

2 is the work-supporting post, it having the throat-plate 3 mounted thereon at its upper end.

4 is the driving shaft, shown as provided with a band pulley 5. Any suitable and desired driving arrangements may be employed.

6 is the needle, 7 is the needle-bar, and 8 is the needle-post, the said needle-post having guides in which the needle-bar moves up and down as usual. The said needle-post is affixed to the projecting front end of the rocker-shaft 9.

10 is a pivot connecting to the needle-bar 7 the upper end of the link 11, the lower end of said link being connected by the pivot 12 to the arm 13 of the rocker-shaft 14.

15 is the cast-off, and 16 is the cast-off bar; the said bar moving up and down in guides in the needle-post 8.

17 is the awl, and 18 is the awl-bar, the said awl-bar moving up and down in guides in the

head 19, as usual, and being actuated by means of the arm 20 on the rocker-shaft 21.

22 is the presser-foot, and 23 is the presser-bar, the latter being mounted in guides in the said head 19.

All of the foregoing parts are or may be of usual character and construction.

24 is a disk or plate mounted upon the inner end of the driving shaft 4, and carrying a compound or double crank pin 25 substantially such as is presented in United States Letters Patent No. 530,471. See Figs. 1 and 3. The main portion of the said crank-pin has applied thereto the eye 26 at the lower end of the connecting-rod 27, the latter having at its upper end a pivotal connection at 28 with the arm 29 of the rocker-shaft 21. Through these devices and connections the awl-bar rocker-shaft 21 is operated.

30 is the offset portion of the crank-pin, from which the needle-bar rocker-shaft 14 is actuated. The said off-set portion 30 receives upon it the eye 31, at the upper end of the connecting rod 32, which latter has at its lower end an eye 33 that is fitted to the pivotal bolt 34 serving to connect it with the arm 35 on the needle-bar rocker-shaft 14. The bolt 34 is set in a slot 36 which is formed in the arm 35, and is secured in the desired position lengthwise of the said slot by means of the nut 37. The adjustment of the bolt 34 along the slot 36 varies the length of the stroke which is transmitted through the arm 35, rocker-shaft 14, arm 13, and link 11, to the needle-bar and needle 6. The slot 36 is curved, and when the arm 35 has been raised into its highest position the said slot 36 corresponds with the arc of a circle that is concentric with the portion 30 of the compound or double crank 25. As a result of this arrangement of the slot with reference to the portion 30 of the double or compound crank, the adjustment of the bolt 34 along the slot 36 has no effect in varying the point which is reached in each rise of the needle, the highest point of the movement of the needle being the same for all adjustments. The latter have merely the effect of varying the extent to which the needle is depressed.

38 (see more particularly Fig. 4) is a cam fixed upon the shaft 4.

39 is a bar in engagement with the said cam

and having one end thereof connected by a bolt 40 with an arm 41 on the cast-off rocker-shaft 42.

43 is a second arm on the said rocker-shaft, it having connected to it by pivotal screw 44 the upper end of the link 45, which latter has its lower end connected by the pivotal screw 46 with the block 47, the said block being made fast to the cast-off bar 16, by means of the screw 48, or in other suitable manner.

The foregoing devices serve for the actuation of the cast-off bar and cast-off.

49 is a slot in the arm 41, along which the pivotal bolt 40 may be adjusted, in order to vary the length of the stroke that is communicated to the cast-off bar and cast-off. The upper end of the bar 39 is open or yoke-shaped to receive the cam 38, and this portion of the bar surrounds the said cam and is in contact with the exterior thereof. The cam 38 has two curved surfaces 381, 382, which are made as arcs of circles that are concentric with the shaft 4, but are different in radii to the extent of the longitudinal throw which is to be given to the bar 39, the said arcs being connected by other arcs 383, 384 which are struck from the opposite ends of the arc 381, as centers.

A change in the length of stroke of the needle-bar and needle should be accompanied in most cases, particularly if such change alters the stroke to any desirable extent, by a corresponding change in the stroke of the cast-off bar and cast-off. The slot 49 enables the stroke of the cast-off bar and cast-off to be changed.

I have found by practical experience that the best results are secured if, when the stroke of the needle bar is varied, and in addition to correspondingly varying the length of the stroke of the cast-off bar, a variation be occasioned in the timing of the stroke of the cast-off bar and cast-off relatively to that of the needle-bar and needle, by beginning the down-stroke of the cast-off at an earlier instant in the down-stroke of the needle.

It is evident that after a change in the length of stroke in the needle bar and needle, such downward movement must be begun and completed within the same time limits as before the change was made. From this it results that the needle-bar and needle are compelled to travel much more rapidly while making a long stroke than while making a short one.

As is well understood by those familiar with machines of the class which includes that illustrated in the drawings, the downward movement of the cast-off does not begin until after a part of the downward movement of the needle has been made, the cast-off then starting and accompanying the needle while the latter continues to descend. If the machine is so constructed and adjusted that, when the needle-bar and needle are working with a short stroke, the cast off will begin to descend at practically the same rate of speed

as that at which the needle is moving, we shall find, after making an increase in the length of stroke of the needle, that the needle will descend more rapidly than the cast-off, when the latter begins its down-stroke. In consequence, there will be a considerable change of relative position between the two, which is undesirable, inasmuch as it tends to cause the thread to be crowded into the hook of the needle and pinched therein.

I remedy the foregoing defects and disadvantages by mounting the arm 41 on the rocker-shaft 42, in a downwardly inclined position, as shown, and I employ the construction of bar 39 and cam 38 above described. When, now, the bolt 40 is adjusted outwardly along the arm 41, in lengthening the stroke of the cast-off, it occasions, as will be apparent, an angular adjustment of the bar 39 with reference to the shaft 4—that is to say, in making this adjustment of the bolt 40 outwardly along the arm 41 of the rocker-shaft 42, the bar 39 is swung through a small number of degrees around the shaft 4. The direction of rotation of the shaft 4 is as represented by the arrow in Fig. 4. It results from this that the downward movement occasioned by the portion 384 of the cam 38 begins at an earlier moment in the order of the movement of the parts of the mechanism. In other words, the angular adjustment of the bar 39, quickens, as it is termed, the action of the cam 38 in the timing of the parts. In consequence of being started earlier with relation to the timing of the descending movement of the needle, the movement of the cast off already has become somewhat accelerated by the time that the hook of the needle has descended to the point of the cast-off, and hence the two continue to descend more nearly in perfect unison than otherwise would be possible.

50 is another cam mounted to the shaft 4 and rotating within an opening or yoke in the arm 51. From the said arm 51, the needle-post rocker-shaft 9 is actuated. For this purpose, I make use, by preference of the mechanism which is presented in Letters Patent of the United States No. 507,786, to which reference may be had. The upper end of the arm 51, see Figs. 1 and 5, carries a pivotal screw 52, which receives the eye 53 of the link 54. The other end of the said link has an eye 55 fitting the pivotal bolt 56 which is set in the slot 57 of the arm 58, the latter being sleeved upon the thread-guide rocker-shaft 59. The said thread-guide rocker-shaft 59 is mounted in bearings at 60, 61 in which it is arranged to rock and to slide endwise. Adjustment of the bolt 56 in the slot 57 enables the length of the movement transmitted to rocker-shaft 59 to be varied. The end of the rocker-shaft 59 which receives the arm 58 has formed therein a groove or grooves 62, into which is received a key or keys 63 to cause the arm and rocker-shaft to turn in unison while permitting the rocker-shaft to move lengthwise

through the eye or hub of the arm. Through these devices the rocker-shaft is rocked in the bearings 60 and 61.

64 is a side-cam mounted on the shaft 4 and acting against a pin or roller shown by dotted lines in Fig. 1, which is mounted upon one arm of a lever 65. The other arm of the said lever bears against the end of the rocker-shaft 59.

66 is a collar held by a screw 67 upon the rocker-shaft 59, and 68 is a spiral spring surrounding the said rocker-shaft and located between the collar 66 and the part of the machine which contains the bearing 61. The spring and cam act in opposition to each other in producing the longitudinal movements of the rocker-shaft 59.

The forward end of the rocker-shaft 59 is bored transversely to receive the cylindrical pin 69, which latter is held therein by the clamping screw 70. The block 71 applied to the pin 69 is bored at right angles to the bore of the rocker-shaft, and receives the cylindrical stem of the thread-guide 72, which is held in place by the clamping screw 73. The pin 69 may be adjusted in the direction of its length relatively to the rocker-shaft, and may be turned on its longitudinal axis. In like manner, the thread-guide may be adjusted longitudinally in the block 71, and may be rocked upon its axis.

A modified means of connecting the arm 58 and the rocker-shaft 59 so as to compel them to turn in unison about the axis of the said rocker shaft but with capacity for permitting movement of the said rocker-shaft in the direction of its length is shown in Figs. 6 and 7. In these figures, the outer end of the rocker-shaft is squared off and to the same is fitted a bushing 74. This bushing is slotted lengthwise thereof from the periphery to and beyond the center. A gib 75 fitted to the said slots fills that portion thereof which is not occupied by the squared portion of the shaft. This gib is somewhat longer than the distance from the outer side of one of the ears 76 to the outer side of the other of said ears 76, and the up-turned ends 751, 751, of the said gib 75 are at the outer side of the said ears 76, 76. Thereby the gib is prevented from moving endwise with the shaft as the latter reciprocates. The hub or sleeve of the arm 58 is fitted to the exterior of the bushing 74 between the ears 76, which also in the case of the construction which is represented in Figs. 1 and 5, hold the said arm from movement in the direction of the length of the rocker-shaft 59. Through the side of the

sleeve or hub of the arm 58 extends a screw 77, the inner end of which takes against the bushing 74, and locks the two together so that the bushing and arm must turn as one. A second screw 78 also extends through the sleeve or hub of the arm 58 and takes against the gib 75. This latter screw enables the gib to be forced into intimate contact with the adjacent surface of the squared portion of the rocker-shaft 59 and also provides for taking up wear.

I claim as my invention—

1. The combination with the needle-bar, means for actuating the same, means for adjusting the length of stroke of the needle-bar, the cast-off, its rocker-shaft, and operating connections intermediate the said cast-off and rocker-shaft, of actuating means for the rocker-shaft, and adjusting means to increase the throw of the rocker-shaft and quicken the timing of the cast-off, substantially as described.

2. The combination with the cast-off, its rocker-shaft, and operating connections intermediate the said parts, of an arm on the said rocker-shaft, an actuating cam, a bar connected with the said arm and acted upon by the said cam, and means to adjust the connection of the bar lengthwise of the arm and simultaneously therewith effect an angular adjustment of the bar relatively to the cam, whereby the timing of the cam's action is quickened, substantially as described.

3. The combination with the cam 50 and side cam 64, of the lever 51 formed with the yoke fitted to the exterior of the cam 50, the arm 58, the link 54 connecting said lever and arm, the rocker-shaft 59 connected to the said arm so as to rotate therewith but to move endwise relatively thereto, the lever 65 acted upon by cam 64 and moving rocker-shaft 59 lengthwise, a spring acting in opposition to the cam 64, and a thread-guide carried by the said rocker-shaft, substantially as described.

4. The combination with the rocker-shaft 59 having a hole through it, of the cylindrical pin 69 adjustable in the said hole, the clamping screw 70, block 71 carried by the said pin and having a hole therethrough, the thread-guide having a cylindrical stem, adjustable in the hole of said block and the clamping screw 73, substantially as described.

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

HEBER C. PETERS.

Witnesses:

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