June 9, 1931. R. E. CAHILL ET AL 1,809,192

HAND SEWING MACHINE

Filed July 14, 1928 3 Sheets-Sheet 1

Fig. 1.

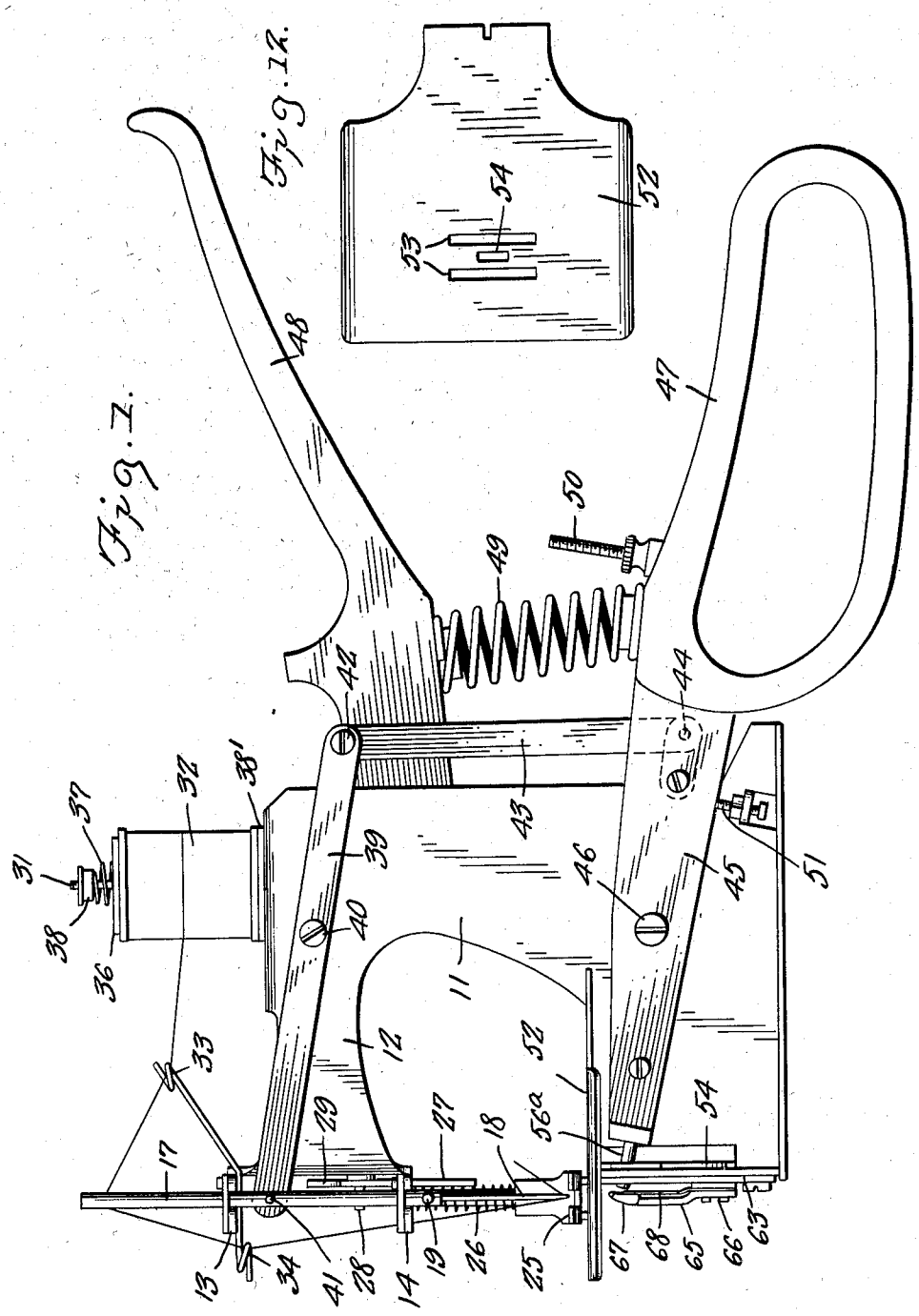


Fig. 1a.

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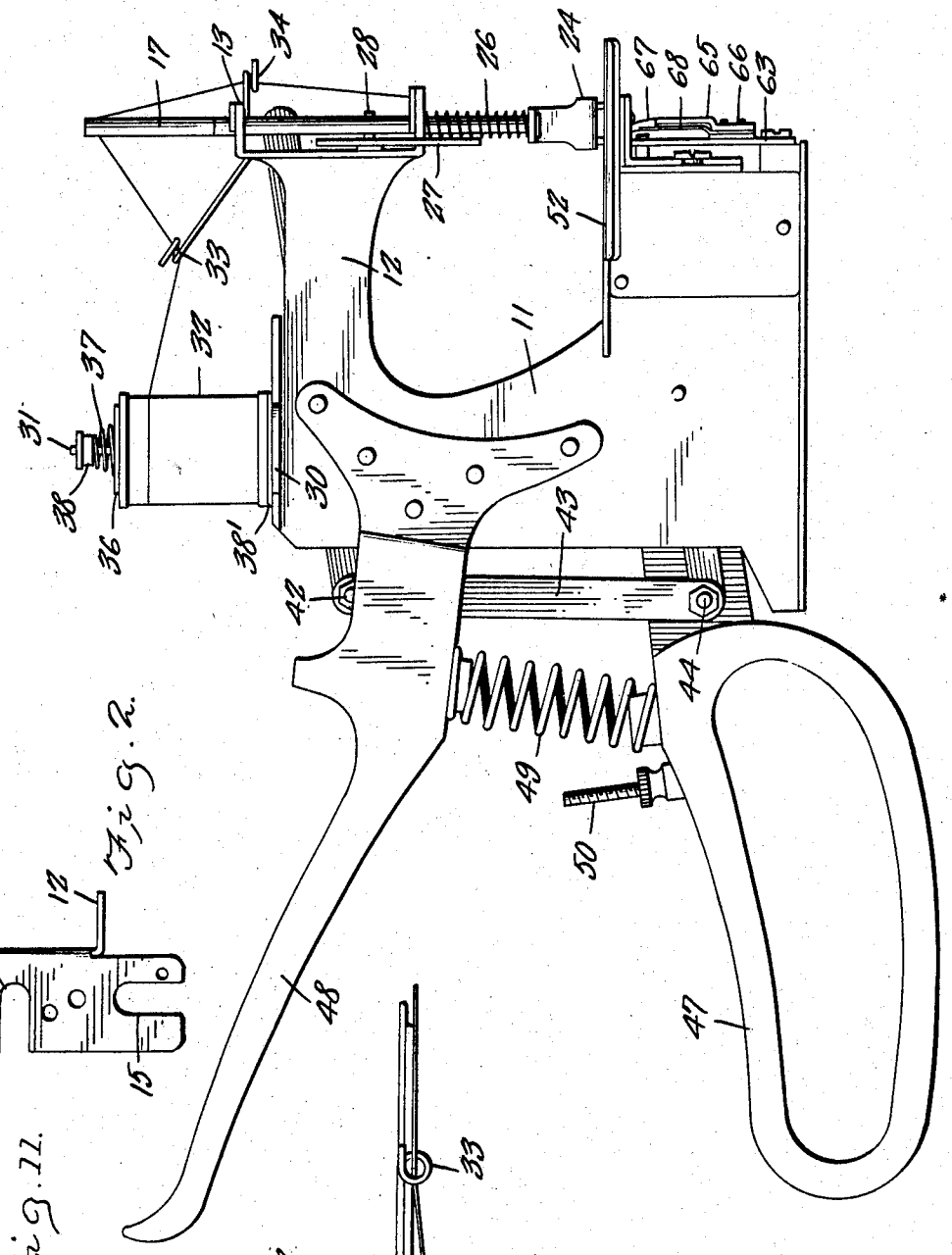


Fig. 2.

Fig. 11.

Fig. 10.

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HAND SEWING MACHINE

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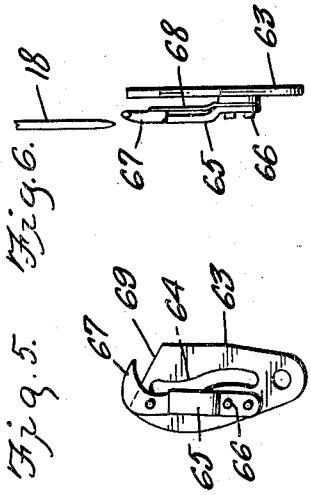


Fig. 6.

Fig. 5.

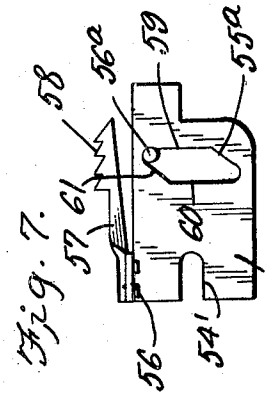


Fig. 7.

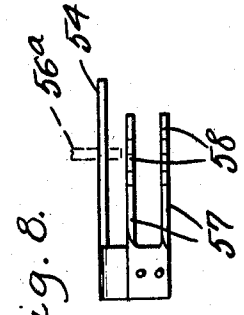


Fig. 8.

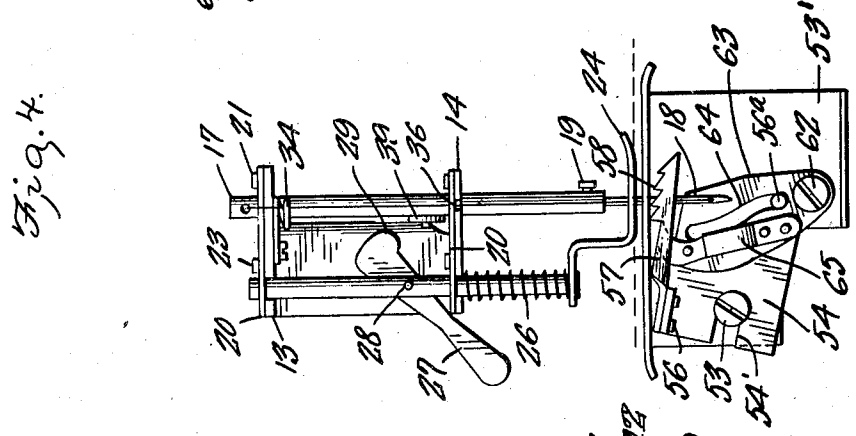


Fig. 4.

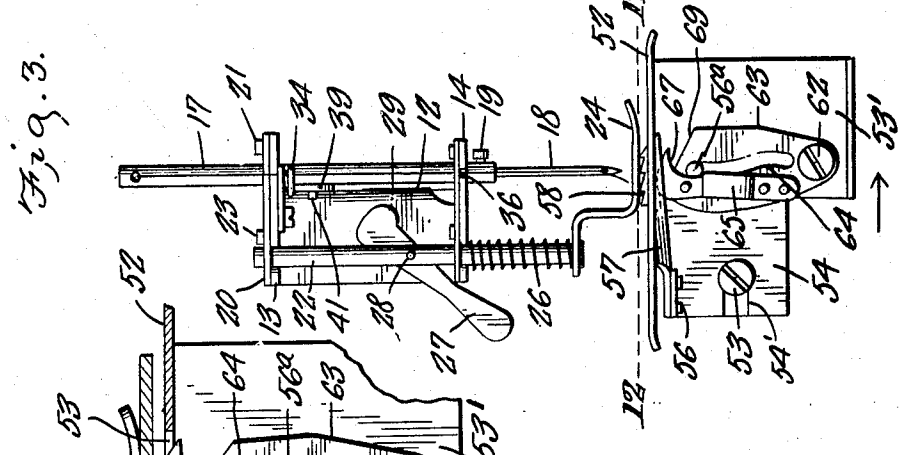


Fig. 3.

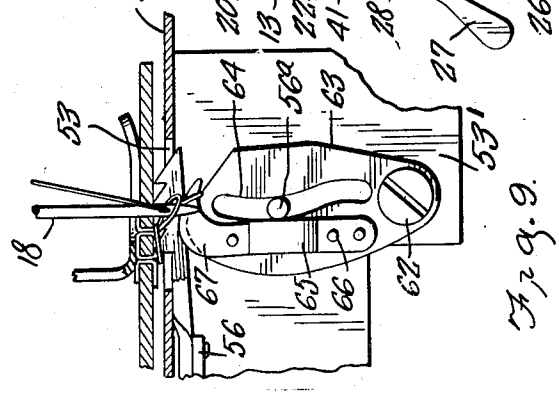


Fig. 9.

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Patented June 9, 1931 1,809,192

UNITED STATES PATENT OFFICE

ROBERT E. CAHILL AND JOHN CATERINI, OF CLEVELAND, OHIO

HAND SEWING MACHINE

Application filed July 14, 1928. Serial No. 292,659.

This invention relates to sewing machines of the portable type and has for an object the provision of a machine which is simple in construction, reliable in use and may be operated by hand, the construction being such that the machine may be manufactured and sold at a low cost.

Another object of the invention is the provision of a sewing machine which is light in weight and may be manipulated by hand after the manner of an ordinary pair of shears, so that the machine may be easily handled and conveniently carried about and operated to stitch any ordinary material without undue fatigue.

Another object of the invention is the provision of a novel stitching mechanism and a novel work feeding means, together with means common to both the stitching mechanism and the feeding means for operating the same.

With the above and other objects in view, the invention further includes the following novel features and details of construction, to be hereinafter more fully described, illustrated in the accompanying drawings and pointed out in the appended claims.

In the drawings:—

Figure 1 is a side elevation of a sewing machine constructed in accordance with the invention.

Figure 2 is a side elevation looking at the side opposite that shown in Figure 1.

Figure 3 is an end view showing the presser foot lowered and the stitch forming mechanism and the work feeding mechanism in normal position.

Figure 4 is a like view showing a different position of the stitch forming and work feeding mechanisms, the needle of the stitch forming mechanism being in its lowermost position while the feed arm of the work feeding mechanism is in position to be disengaged from the work.

Figure 5 is a detail elevation of the stitch forming cam plate and hook.

Figure 6 is an edge view with a fragmentary portion of the needle above the hook.

Figure 7 is a side elevation of the cam plate and the feed arm of the work feeding mechanism.

Figure 8 is a top view of the latter.

Figure 9 is an enlarged fragmentary sectional view illustrating the formation of a stitch.

Figure 10 is a fragmentary top plan view of the outer end of the machine.

Figure 11 is a detail plan view of one of the guide plates.

Figure 12 is a fragmentary section on the line 12—12 of Figure 3.

Referring to the drawings in detail wherein like characters of reference denote corresponding parts, the machine which is designed to be light in weight includes a plate 11 which may be formed of sheet metal, an arm 12 extending from the plate. The outer end of the arm 12 carries spaced upper and lower horizontally arranged plates 13 and 14, and each of these plates is provided with a slot 15 extending inwardly at one end, with a slot 16 which extends inwardly at one side adjacent the other end. The slots 15 are vertically aligned as are also the slots 16, while the slots 15 accommodate a longitudinally reciprocable needle rod 17 whose lower end carries a needle 18, a binding screw 19 being provided for removably holding the needle in position. Mounted upon each of the plates 13 and 14 are retaining plates 20 which, as shown in Figure 10 of the drawings, are pivotally mounted at one end as shown at 21. These plates 20 are shaped to close the slots 15 and 16 so as to provide guide openings, the guide openings at one end of the plates accommodating the needle rod 17 while the guide openings at the other ends of the plates slidingly receive a foot rod 22. The retaining plates are held against pivotal movement by means of screws 23.

Secured to the lower end of the foot rod 22 is a presser foot 24 which is bifurcated after the manner of the usual presser foot as shown at 25 so as to permit of the passage of the needle 18 therethrough. This presser foot is yieldingly forced downward by means of a spring 26 which surrounds the rod 22, and may be held in raised position for the insertion of the work through a lever 27. This

lever is pivotaly mounted as shown at 28 upon the rod 22 and carries a cam portion 29 which engages the lower plate 14 as shown in Figure 4 of the drawings and acts to hold the presser foot raised.

Rising from the inner end of a lateral extension 30 at the inner end of the arm 12 is a post 31. This post accommodates a spool of thread 32, the thread passing through guides 33 and 34 at opposite sides of the needle rod and through a guide opening 36 formed in the lower plate 14 and in the retaining plate 20 which is pivotally mounted upon this lower plate. The thread is then passed through the eye of the needle in the ordinary manner, so that when the needle rod is reciprocated in the operation of the machine, the threads will be unwound from the spool. A washer 38′ is located at the lower end of the post 31 and the washer 36 is positioned upon top of the spool of thread, while a spring 37 bears upon this upper washer and is tensioned by a nut 38 which threadedly engages the post. By means of the nut 38 the tension of the threads may be regulated so that the thread will be properly fed when the machine is in operation.

In order to reciprocate the needle rod 17, a rocker arm 39 is pivotally mounted at 40 at the top of the plate 11 and one end of this arm has a pivotal connection 41 with the needle rod 17. The opposite end of the rocker arm 39 is pivotally connected as at 42 with the upper end of a rod 43, and the lower end of this rod has a pivotal connection 44 with an operating lever 45. The lever 45 is pivotally mounted upon the plate as shown at 46 and has extending therefrom a finger grip 47. Rigid with the plate 11 is an arm 48 which forms a thumb grip, so that when the fingers and thumb are engaged around the respective finger and thumb grips, the lever 45 will be rocked upon its pivot so as to actuate the rocker arm 39 and reciprocate the needle rod. Movement of the lever 45 is yieldingly resisted by means of a spring 49 which is interposed between the thumb grip 48 and the finger grip 47. A stop 50 acts to limit relative inward movement of the thumb and finger grips and consequently pivotal movement of the lever 45 in one direction, while a stop 51 which is mounted upon the plate 11 limits pivotal movement of the lever 45 in an opposite direction.

Supported by the plate 11 is a horizontally arranged work plate 52. This plate is provided with spaced slots 53 between which is a centrally arranged slot 54 for the passage of the needle.

Located beneath the work plate 52 and slidingly and pivotally secured to a plate 53′ which depends from the work plate is a cam plate 54. This plate is provided at one end with a notch 54′, which loosely receives a screw 55 carried by the plate 53′, so that the cam plate 54 will have a sliding pivotal movement on the screw. The plate 54 is provided with a lateral extension 56 and secured to this extension are spaced parallel arms 57. The upper edges of these arms are toothed as shown at 58 and these teeth are adapted to move into and out of the slots 53 when the plate 54 is operated.

In order to move the plate 54, the latter is provided with a cam slot 55*a* within which extends a stud 56*a* which projects from the end of the operating lever 45. This stud also projects through an opening in the plate 53′ and when the lever 45 is moved pivotally, this stud will engage the edge 59 of the cam slot 55*a* and move the cam plate in the direction of the arrow shown in Figure 3 of the drawings. The plate 54 will drop by gravity so that the movement will be forward and downward as shown in Figure 4. The feed arms 57 will thus move out of their slots 53 and will be disengaged from the work upon the work plate. As the arm 45 moves upward, the stud 56*a* engages the edge 60 of the slot 55*a* so that the plate 54 is moved rearwardly and when the said stud engages the inclined upper portion 61 of this slot, an upward and continued rearward movement of the plate is effected so that the teeth of the arms 57 will engage the work and move the latter rearwardly.

Pivotally mounted upon the plate 53′ as shown at 62 is a cam plate 63. This plate is provided with a cam groove 64 into which the stud 56*a* also extends. The plate 63 has secured to its outer face a loop forming hook. This hook is of sectional formation and comprises a lower section 65 which is rigid with the plate as shown at 66, while the bill end 67 of the hook is carried by a spring finger 68 whose lower end is rigid with the plate 63. As shown in Figure 6 of the drawings, the pointed end of the needle in its downward movement will engage the outer face of the bill end of the hook so that this end of the hook may move inward toward the plate 63.

In the use of the machine, the presser foot is raised through movement of the lever 27 as previously explained, the needle being threaded, the work is positioned upon the work plate beneath the presser foot and the latter is lowered so that the work is engaged by both the presser foot and the feed arms 57. Upward pivotal movement of the operating lever 45 will, through the rocker arm 39 and the connecting rod 43, force the needle downward through the work. In its downward movement, the point of the needle will force the bill 67 of the hook 65 inward toward the plate 63 against the tension of the spring 68. Continued movement of the operating lever will move the cam plate 63 to the left of the position shown in Figure 3 of the drawings, carrying with it the hook.

Movement of the operating lever in an op-

posite direction under the action of the spring 49 will move the needle upward and the hook will move from the position shown in Figure 4 to the position shown in Figure 3, so that the bill will pass between the inside of the needle and the thread and the latter will be looped around the bill as shown in Figure 9 of the drawings. The next downward movement of the needle will cause the latter to enter this loop, and as the hook will again move to the position shown in Figure 4 during downward movement of the needle, the previously formed loop will be withdrawn from the bill of the hook. When the hook again moves to the position shown in Figure 3 of the drawings, a second loop will be formed through which the needle will pass in its next downward movement. A chain stitch will thus be provided.

The upper edge of the cam plate 63 is beveled as shown at 69 so as to permit the feed arms to move downward as shown in Figure 4 of the drawings, and when the cam plate 63 moves from the position shown in Figure 4 to that shown in Figure 3, the high point on the cam plate 63 will engage the under edge of one of the feed arms 57 and assist in moving the latter upward. The cam plate 54 moves downward by gravity.

The invention is susceptible of various changes in its form, proportions and minor details of construction and the right is herein reserved to make such changes as properly fall within the scope of the appended claims.

Having described the invention what is claimed is:

1. In a sewing machine, a plate, an arm extending therefrom, a needle carrying rod mounted for longitudinal reciprocatory movement at the outer end of the arm, a spring influenced rod also mounted for longitudinal movement at the outer end of the arm, a presser foot carried by the spring influenced arm, means cooperating with the presser foot to feed the work, a lower stitch forming mechanism, an operating lever mounted for pivotal movement upon the plate, a rocker arm also pivotally mounted upon the plate and operatively connected to the carrying rod, a rod connecting the operating lever and rocker arm to actuate the latter and operate the needle, and means carried by said lever and engaging both the work feeding means and the lower stitch forming mechanism to operate the same.

2. In a sewing machine, a plate, an arm extending therefrom, a needle carrying rod mounted for longitudinal reciprocatory movement at the outer end of the arm, a spring influenced rod also mounted for longitudinal movement at the outer end of the arm, a presser foot carried by the spring influenced arm, means cooperating with the presser foot to feed the work, a lower stitch forming mechanism, an operating lever mounted upon the plate, means operatively connecting said lever and the needle carrying rod to actuate the latter, a movable cam plate connected with the work feeding means to operate the latter, a cam plate connected with the lower stitch forming mechanism and means carried by the operating lever and engaging both cam plates to operate both the work feeding means and the lower stitch forming mechanism.

3. In a sewing machine, a work plate, a thread carrying needle mounted for reciprocatory movement through said plate, a cam mounted for movement beneath the plate, a hook carried by the cam and having a laterally flexible bill located in the path of and flexed by engagement with the needle, said hook being arranged for passage between the needle and thread when the needle is reciprocated, means to reciprocate the needle, means to feed the work step by step during reciprocatory movement of the needle, and means to move the cam.

In testimony whereof we affix our signatures.

ROBERT E. CAHILL.
JOHN CATERINI.