(No Model.)

R. STOCKER.

LOOPER MECHANISM FOR SEWING MACHINES.

No. 583,391. Patented May 25, 1897.

FIG. 1.

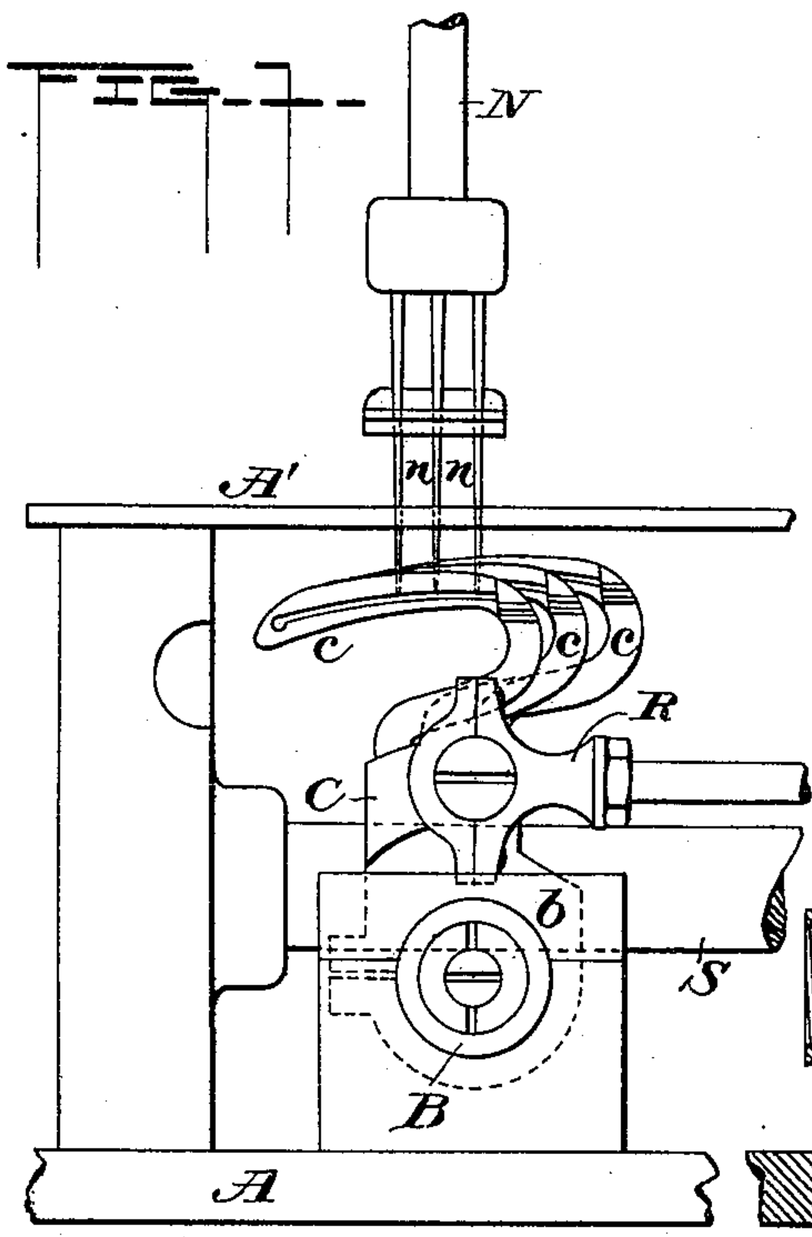


FIG. 2.

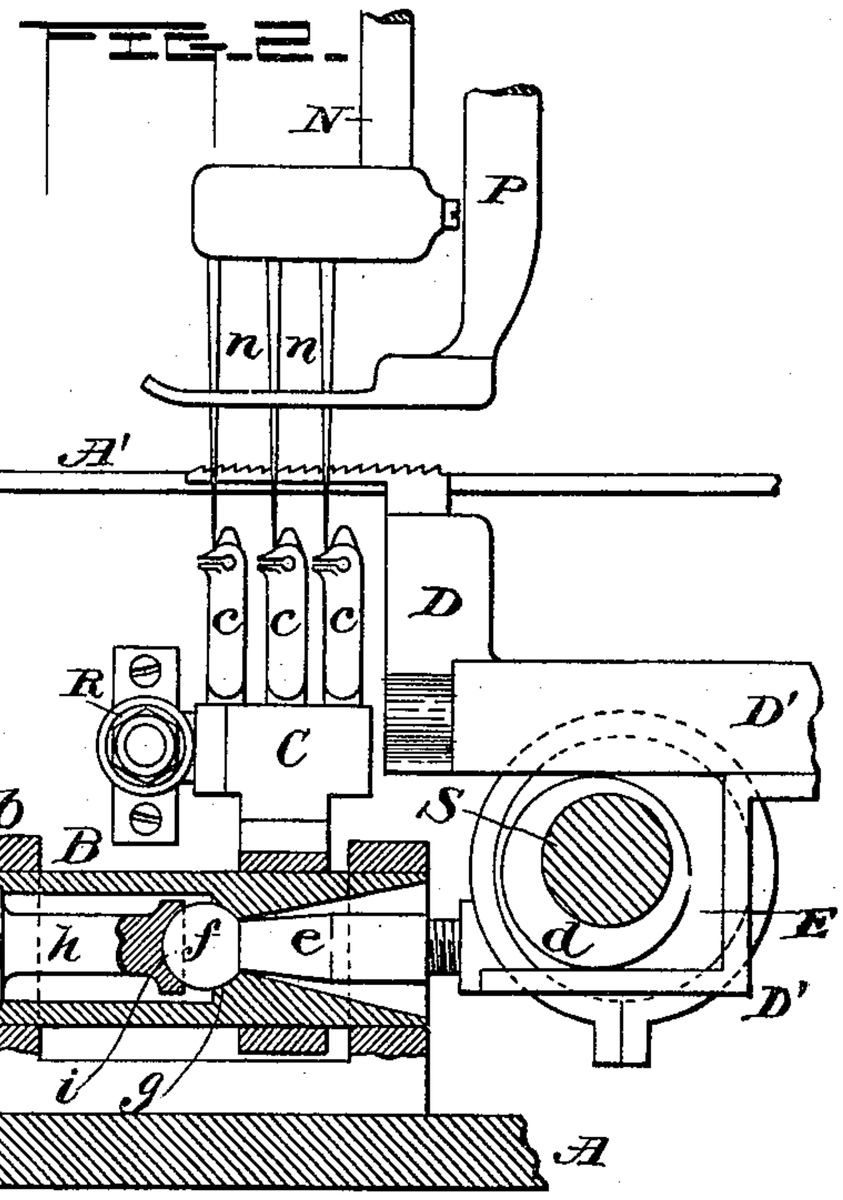
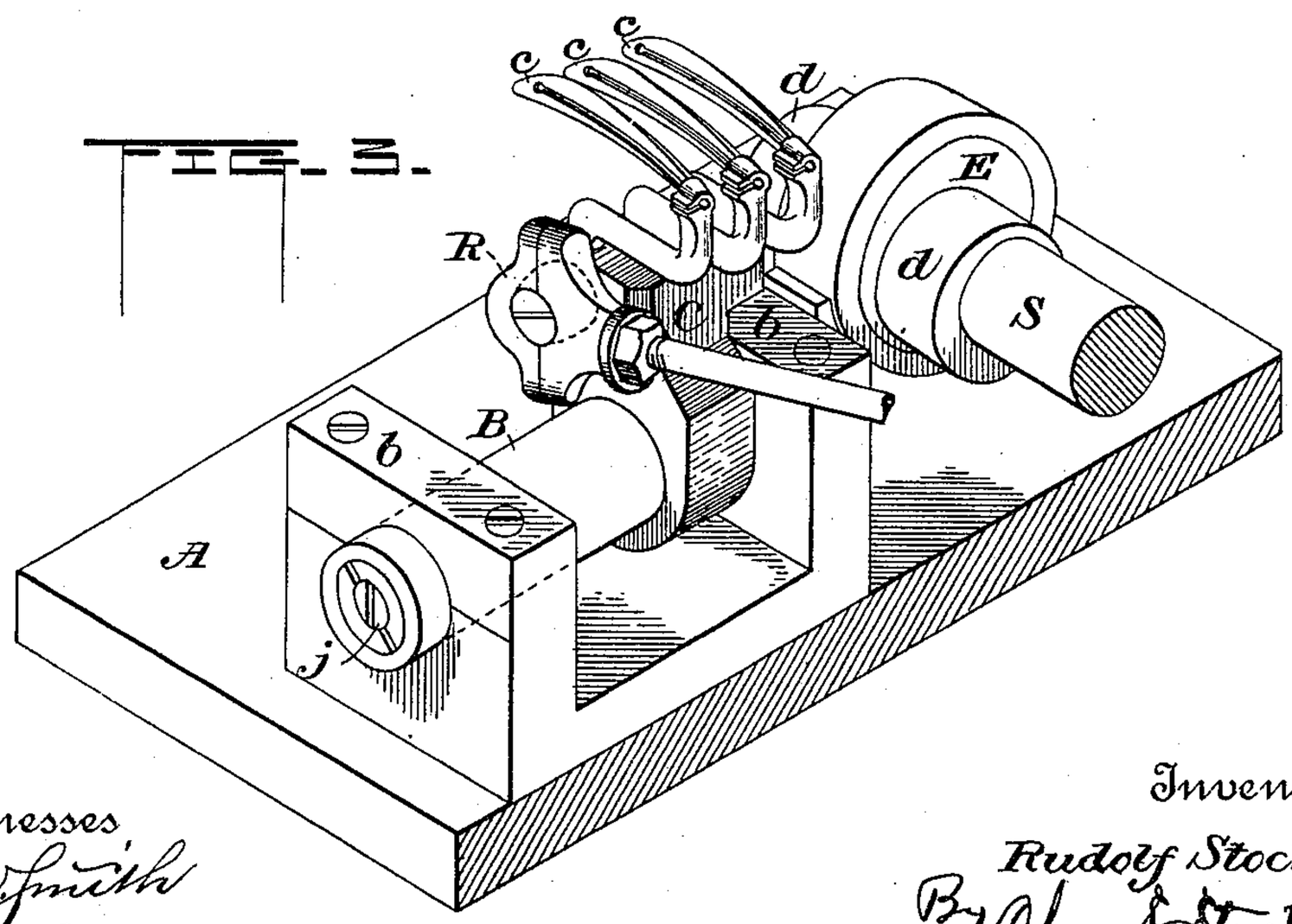


FIG. 3.



Witnesses
C. W. Smith
Jules P. Moore

Inventor
Rudolf Stocker
By Chas. L. Sturtevant
Attorney

UNITED STATES PATENT OFFICE.

RUDOLF STOCKER, OF BROOKLYN, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE UNION SPECIAL SEWING MACHINE COMPANY, OF CHICAGO, ILLINOIS.

LOOPER MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 583,391, dated May 25, 1897.

Application filed September 10, 1894. Serial No. 522,628. (No model.)

To all whom it may concern:

Be it known that I, RUDOLF STOCKER, a citizen of the United States, and a resident of Brooklyn, Kings county, New York, have invented Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to sewing-machines, and more especially to that class in which a looper on the under side of the cloth-plate is combined with a vertically-reciprocating needle carrying the upper thread; and the object of the invention is to provide an improved means for imparting to the looper the movement necessary to produce, in connection with the needle, the desired stitch, which in the present case is a double-loop stitch. such as is characteristic of the well-known Grover & Baker sewing-machine.

The invention is herein shown as applied to a machine in which three needles and three loopers are used, designed for such work as corset-sewing; but it will be understood that the invention may be employed with a single needle and single looper, as for ordinary line-sewing, or with any other number of needles and loopers that may be desirable.

The invention consists, therefore, in the matters hereinafter described, and referred to in the appended claims.

In the accompanying drawings, which illustrate the invention, Figure 1 is a front elevation of so much of a sewing-machine as is sufficient for a correct understanding of my invention. Fig. 2 is a transverse section of the same, and Fig. 3 is a perspective view.

In the drawings, A represents the bottom plate of the machine, supporting the cloth-plate A′, of usual construction.

N is the needle-bar, herein shown as provided with three needles *n*.

P is the presser-foot, and D the feed-dog, (shown in dotted lines,) its frame D′ being forked and operated by the cams *d d* on the main shaft S, this main shaft being herein shown as extending longitudinally of the machine, the feed being at right angles to the axis of said shaft.

Arranged transversely of the machine or at right angles to the main shaft is a bar or shaft B, having bearings in the journals *b b*, supported on the frame of the machine. A slight reciprocation is given this shaft B in the direction of its length by means of the eccentric E, carried on the shaft S between the cams *d d* and working in the slot formed by the forks in the frame D′, which eccentric carries the connecting-rod *e*, having a ball *f* on its end. The shaft or bar B is hollow, its end adjacent the shaft S being contracted to form shoulders *g*, rounded off to act as a seat for said ball *f*, the inner portion of the bar or shaft B from the shoulders *g* enlarging outwardly to allow of the perfectly free movement of the connecting-rod *e* when actuated by the eccentric. To afford a seat for the front end of the ball *f*, a screw-threaded piece *h* is inserted into the outer end of the shaft or bar B, having a socket *i*, in which the ball fits, this part *h* being screw-threaded to receive a jam-screw *j*.

Fixed upon the bar or shaft B is a looper-carrier C, herein shown as provided with three loopers *c*, coöperating with the needles *n* to form the stitches. To give the desired oscillatory movement to the loopers, a connecting-rod R is freely jointed to the looper-carrier, and at the other end said rod is attached to and reciprocated by a moving part of the machine, such as the needle-lever. It will thus be seen that in the movement of the main shaft the shaft B will reciprocate in the direction of its length and at the same time will rock back and forth in its bearings *e* on the ball *f* as a pivot. While the main shaft is herein shown as extending longitudinally of the machine and the shaft or bar B at right angles thereto or transversely to the machine, it will be obvious that this arrangement of parts may be reversed. While, also, the shaft or bar B is herein shown as hollow and connected to the main shaft and deriving both reciprocatory and oscillatory movements in a certain specified manner, it will be understood that I do not wish to be limited absolutely to such an arrangement, as changes in such construction might be made, and, furthermore, various other minor modifications and changes in the construction of the various parts may be made without departing from the spirit of my invention.

As will be apparent, the loop-taking movement of the looper is of necessity longer than the needle-avoiding movement. By making the rocking of the carrier give the looper its loop-taking movement and the sliding of the carrier its needle-avoiding movement much friction is avoided, thereby making the present arrangement of considerable practical advantage when applied to a high-speed machine. Irrespective, however, of the specific advantage thus obtained by rocking the carrier in one direction and sliding it in its transverse movement, another feature which is of peculiar advantage in obtaining the proper coördination of the needle and looper movements at a high rate of speed is the manner in which the power is applied for giving the sidewise or needle-avoiding movements, and as to this particular feature, by which any twisting or binding of the parts is minimized, it will be readily seen that I do not want to be limited specifically to a sliding looper carrier or support. In other words, no matter how said looper-carrier may be supported, there is an advantage in applying the power directly to the looper-support substantially in the line of the axis on which the looper oscillates longitudinally, thereby getting a positive directly-applied force acting on the support at practically the most effective point, thus avoiding the great leverage twisting or binding which is likely to take place when the application of the driving power is at a remote point.

Havings thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a sewing-machine, the combination, with a thread-carrying looper having oppositely-extending journals, of fixed bearings for said journals, complemental stitch-forming mechanism and mechanism for imparting to the looper a positive loop-taking movement in the arc of a circle and a positive needle-avoiding movement in a right line, whereby drag on the needle-thread is prevented and liability of the looper striking the needle is avoided; substantially as described.

2. In a sewing-machine, the combination, with a needle, of an under thread-carrying looper, trunnions bearing in fixed supports on the machine-frame constituting the center of motion of said looper and extending oppositely to each other and at an angle to the longitudinal axis of the looper, and means for positively operating said trunnions to give a forward-and-backward loop-taking and loop-leaving movement to the looper, and positive means for sliding said trunnions axially in their bearings to give the looper a needle-avoiding movement; substantially as described.

3. In a sewing-machine, the combination, with the needle and means for operating the same, of a looper, a carrier therefor, said carrier being mounted in and being free to slide and to rock in bearings, means for sliding and rocking said carrier, said sliding movement being at right angles to the length of the looper whereby the longer loop-taking movement of the looper is given by the rocking movement of the carrier and the shorter needle-avoiding movement of the looper is given by the sliding movement of the carrier and friction thus reduced; substantially as described.

4. In a sewing-machine, the combination, with a thread-carrying needle, and a feeding device having movement in a defined path, of a thread-carrying looper, the longitudinal axis of said looper being at an angle to the line of feed, means for giving to said looper four movements, viz: a positive loop-taking and positive loop-leaving movement at an angle to the line of feed and in the direction of the longitudinal axis of the looper, and two positive needle-avoiding movements, two of said movements being in the arc of a circle and the other two being bodily movements in a right line, across the line traversed by the looper in its first-named movements; substantially as described.

5. In a sewing-machine, the combination, with a needle, of a looper having journals arranged on opposite sides of one of its axes, fixed bearings in which said journals are mounted, and positive means for sliding and rocking said looper; substantially as described.

6. The combination in a sewing-machine of a main shaft, a relatively short shaft arranged adjacent the forward end of the main shaft and with its axis transverse to the axis of the main shaft and having pivotal bearings axially movable in fixed supports, a thread-carrying looper secured to said shaft between its bearing-points and positively-operating connections between the main shaft and looper-shaft whereby said looper may be reciprocated laterally bodily and oscillated horizontally; substantially as described.

7. The combination in a sewing-machine of a main shaft, and axially-movable shaft supported in bearings on the machine-frame, a reciprocating needle, an eccentric and universal-joint connection between the main shaft and axially-movable shaft whereby the latter is reciprocated, a looper secured to said axially-movable shaft between the bearings of said shaft and means for oscillating said shaft in its pivotal bearings; substantially as described.

8. The combination in a sewing-machine with a driving-shaft of an axially-movable shaft arranged at right angles thereto and supported in bearings on the machine-frame, a looper rigidly fixed to said shaft between the pivotal points thereof, an eccentric and ball-and-socket connection between the driving-shaft and the axially-movable shaft whereby bodily movement in a right line is given said shaft and looper and means for oscillating said axially-movable shaft; substantially as described.

9. A sewing-machine comprising a main shaft, a second shaft arranged with its axis at right angles to the axis of the main shaft, and journaled in bearings on the machine-frame, a looper fixed to said shaft between the bearing-points, an eccentric and universal-joint connection between the main shaft and the second shaft whereby the second shaft is reciprocated and the looper moved bodily in one direction, and an independent driving connection between the main shaft and second shaft whereby the looper is oscillated; substantially as described.

10. A sewing-machine comprising a main shaft, a hollow shaft journaled in the machine-frame, a looper secured to said hollow shaft, an eccentric on the main shaft, and a connecting-rod having on one end a ball fitting within the hollow shaft and universally jointed thereto, and complemental stitch-forming mechanism; substantially as described.

11. A sewing-machine comprising a main shaft, a hollow shaft axially movable in fixed supports on the machine-frame, a looper secured to said hollow shaft between the fixed supports, said hollow shaft having an inwardly-tapering recess at one end, forming a shoulder, a socketed piece set within said hollow shaft and the connecting-rod *c* having the ball *f* on its inner end resting between the socketed piece and the shoulders of the tapering recess and complemental stitch-forming mechanism; substantially as described.

12. In a double-chain-stitch sewing-machine an actuating-shaft, a laterally-moving support, a looper thereon, mechanism for oscillating said looper in the direction of its length, and for actuating the support and with it the looper laterally; said mechanism including a device connected with the actuating-shaft, and directly connected with the looper-support substantially in the line of the axis on which the looper oscillates longitudinally, substantially as described.

13. In a double-chain-stitch sewing-machine an actuating-shaft, a looper having oppositely-extending trunnions or pivot-points, means for supporting said trunnions, mechanism for actuating said looper to give it the desired movements said mechanism including means actuated from said shaft and directly engaging the looper between its trunnions or pivot-points and substantially in line therewith, substantially as described.

14. In a sewing-machine an actuating-shaft, a support, a looper-carrier on said support, and a looper on said carrier, means for oscillating the looper-carrier in the direction of the length of the looper, and means for actuating the looper-support including a device connected with the actuating-shaft and arranged to apply the power for the purpose above specified, directly at right angles with the axis of longitudinal oscillation of the looper, and substantially in the plane of said axis, substantially as described.

15. In a sewing-machine having a feeding mechanism moving in a defined path, a thread-carrying looper having its longitudinal axis at an angle to the line of feed; and means for giving said looper positive movements as follows: a forward-and-backward movement in the direction of its longitudinal axis, and sidewise movements bodily in a right line across the line traversed by it in its other movements; substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RUDOLF STOCKER.

Witnesses:

LOUIS T. WEISS,

JOHN C. BREWER.