

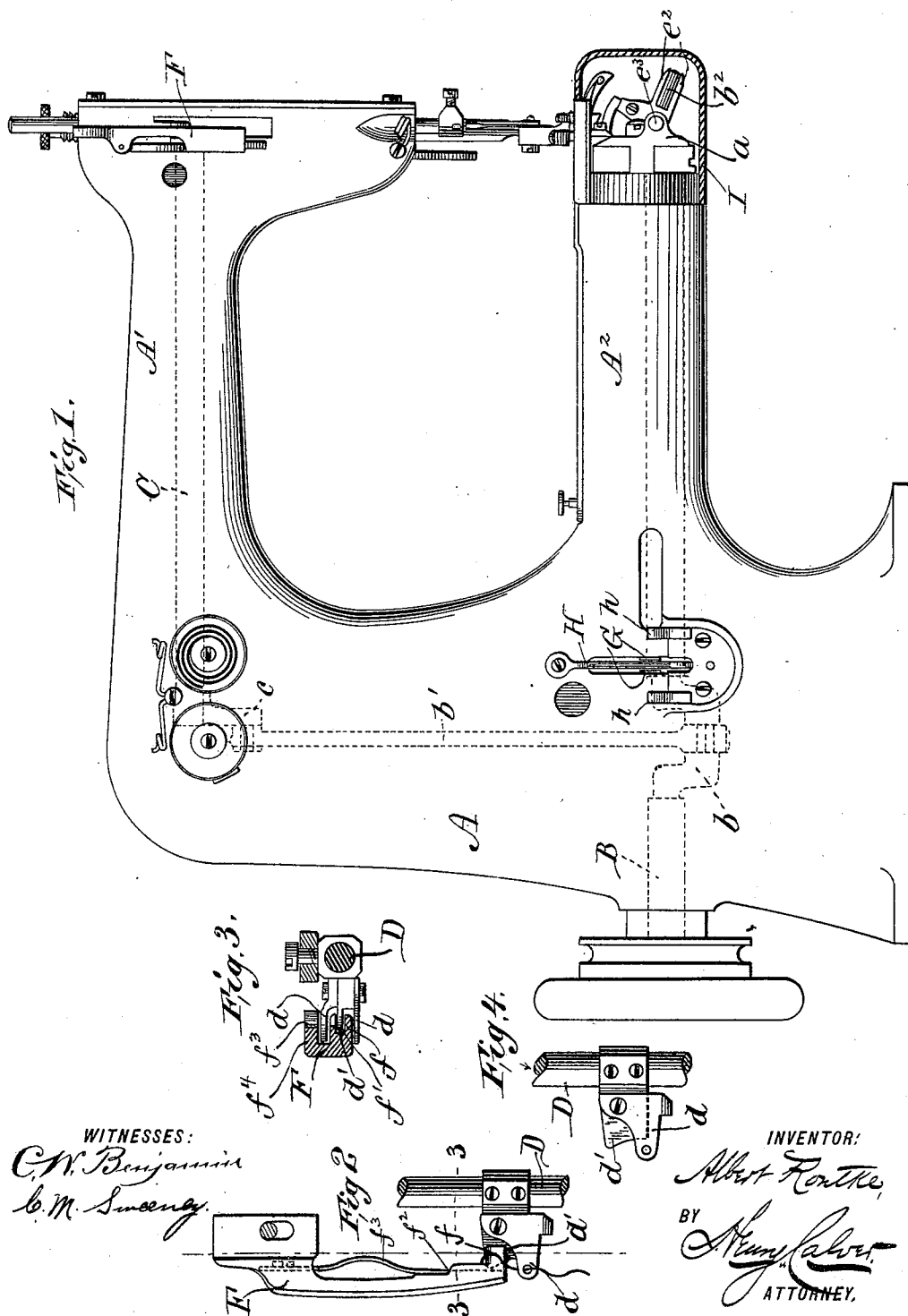
(No Model.)

2 Sheets—Sheet 1.

A. RONTKE.
DOUBLE CHAIN STITCH SEWING MACHINE.

No. 582,691.

Patented May 18, 1897.



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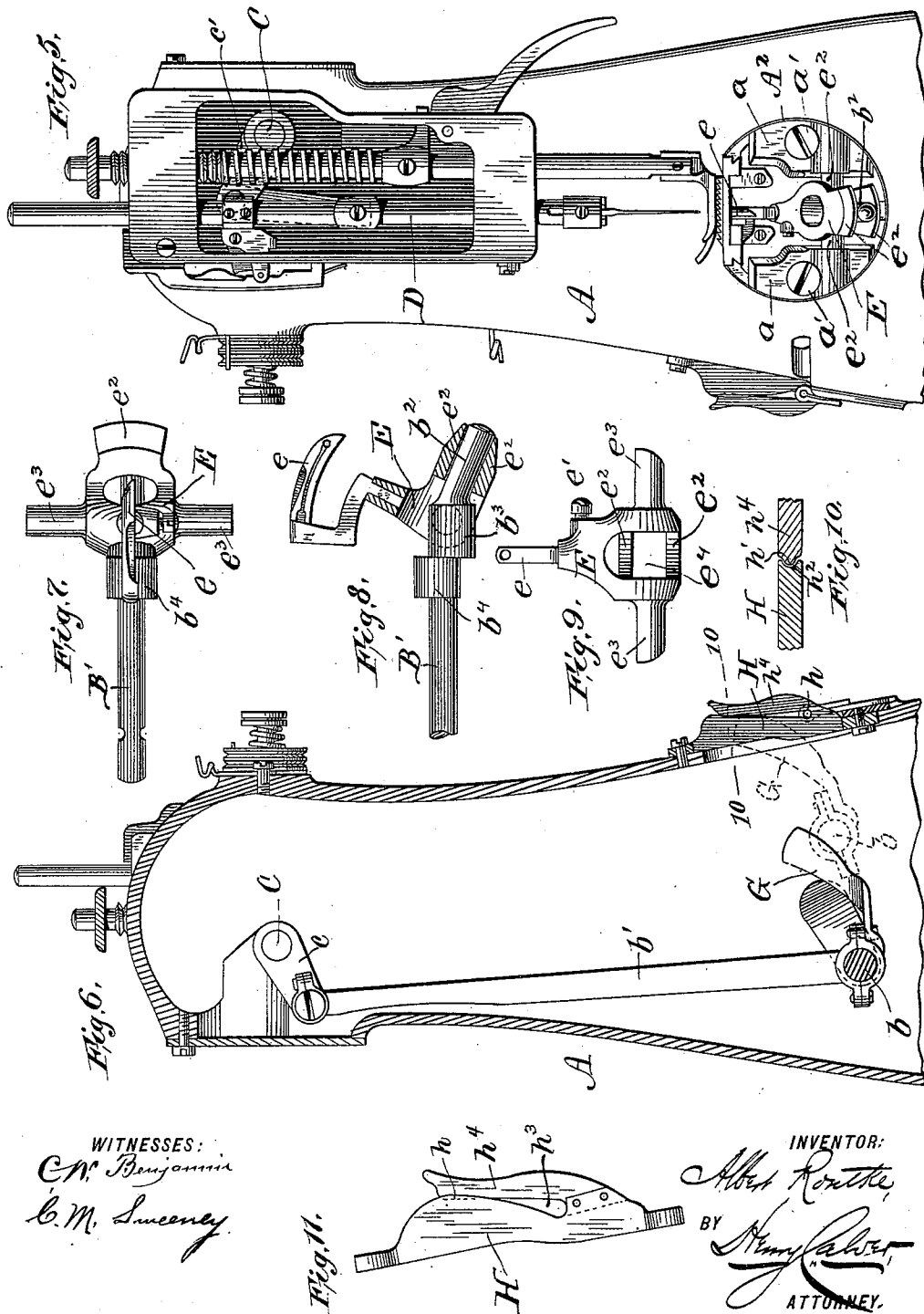
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UNITED STATES PATENT OFFICE.

ALBERT RONTKE, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, OF NEW JERSEY.

DOUBLE-CHAIN-STITCH SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 582,691, dated May 18, 1897.

Application filed November 16, 1894. Serial No. 529,018. (No model.)

To all whom it may concern:

Be it known that I, ALBERT RONTKE, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, 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 that class of sewing-machines which form the double chain-stitch by means of an eye-pointed needle and a co-operating thread-carrying looper; and my invention has for its object to provide a machine of the class referred to which will be simple in construction and in which the movements are strong and positive, so that the machine will be adapted for very high speeds, the leading feature of the invention consisting in the looper-operating mechanism.

In the accompanying drawings, Figure 1 is a sectional side view of a "left-hand-cylinder" machine embodying my invention. Figs. 2, 3, and 4 are detail views of the take-up and controlling device for the needle-thread. Fig. 5 is a front end view of the machine with the face-plate of the head and the cap at the front end of the work-supporting arm or cylinder removed. Fig. 6 is a vertical section through the standard of the frame of the machine. Figs. 7, 8, and 9 are details to show the looper-carrier and its operating devices. Fig. 10 is an enlarged sectional detail on line 10 10, Fig. 6, to show part of the looper-thread-controlling device; and Fig. 11, a detail view of the plate forming part of said thread-controlling device.

The framework of the machine herein shown comprises the standard A, the overhanging arm A', and the cylindrical work-supporting arm A².

B is the driving-shaft, journaled in the lower part of the framework and extending longitudinally of the arm A², said shaft having a crank b, connected by a pitman b' to an arm c at the rear end of a rock-shaft C, journaled in the arm A', said shaft having at its forward end an arm c', connected to the needle-bar D, to reciprocate the latter vertically. Secured to and forming practically an extension or continuation of the shaft B is a supplemental shaft B', the extreme outer end of

which is bent to form the inclined crank b², said shaft B' being provided just rearward of said crank with an eccentric b³.

E is the looper-carrier, and e is the eye-pointed thread-carrying looper suitably secured to said carrier, the shank of said looper in the construction herein shown fitting in a socket in said looper-carrier and being removably secured therein by a set-screw e'. The said looper-carrier is provided with forwardly-extending wings or flanges e², which embrace the inclined crank b², and said carrier is also provided on its opposite sides with laterally-extending pivots or trunnions e³, forming journals having bearings in blocks or bearing-pieces a, secured by screws a' to the forward end of the arm A². The looper-carrier is constructed with an opening e⁴ rearward of the wings or flanges e², the side walls of said opening constituting a yoke in which the eccentric b³ works. Thus when the machine is in operation the crank b², working between the wings or flanges e², will impart a rocking movement to the looper-carrier E on its pivot or trunnions e³, while the eccentric b³, working in the opening or yoke e⁴, imparts lateral movements to the looper-carrier, the pivots or trunnions e³ of the latter sliding laterally in their bearings in the blocks a.

The crank b² and eccentric b³ are so arranged and timed relatively to each other that the looper e will in its vibrating or rocking movements pass forward on one side of the needle to take a loop of needle-thread, will then be moved bodily laterally, so as to rock backward on the other side of the needle as the latter descends for the next stitch, and passes its thread into a loop of the looper-thread, as is necessary in making the double-chain-stitch seam. As these rocking and sliding movements of the looper-carrier are all communicated from the operating-shaft B' and are strong and positive, it will be obvious that this looper mechanism is comparatively noiseless and is well adapted for a high-speed machine.

The crank b² and the eccentric b³ are both forward of the outer or forward bearing of the rotating shaft, by which they are carried or on which they may be formed, and the looper-carrier is thus adapted to be placed

close to the outer or forward end of the work-supporting arm A², (which is advantageous for some kinds of work,) and these operating parts are furthermore thus brought directly into contact with the parts of the looper-carrier to be operated by them.

On the shaft B' is an eccentric b¹, forming part of the feeding mechanism, but as this mechanism is not herein claimed it need not be further described.

I is a removable cap, which in the form of machine herein shown serves as a housing for the looper and feed mechanism.

To properly handle the needle-thread, I have provided a take-up and controlling device which I will now describe. The needle-bar D carries two separated plates d, provided with thread-eyes, and between said plates is secured a thin plate or fin d' to serve as a thread lifter or take-up.

F is a small bracket attached to the frame or head of the machine and having at its lower end a horizontal inwardly-projecting finger f, which is straddled by the thread-eye plates d, said finger f and the lower part of the bracket immediately above it being grooved at f' for the reception of the outer edge of the take-up fin d', said groove terminating at its upper end at the inclined ledge f². Attached to the bracket F is a light check-spring f³, the free lower end of which presses against the inside face of the part f¹ of said bracket. The operation of this take-up and thread-controlling device is as follows: When the needle has descended to its lowest point, the parts are in the positions shown in Fig. 2, and the needle-thread, which runs from the eye of one of the plates d to the other, will be drawn over the finger f, which thus draws the loop of needle-thread off from the point of the retreating looper and also prevents too much slack from being taken down by the needle, and the formation of a loop on the side of the needle opposite that from which the looper is to take the needle-loop is avoided, this action being assisted by the thread-lifting fin d', which as the needle rises lifts the thread from the finger f and carries it upward until the top of said fin reaches the top of the groove f' at the inclined ledge f², when the thread slips off from said fin, but is subsequently lifted by the eyes in the plates d far enough to properly set the stitch. When the needle next descends, the check-spring f³ momentarily detains the thread, and thus holds the slack up out of the way of the point of the descending needle. The thread is drawn beneath said check-spring f³ on the descent of the needle-bar by the eyes of the plates d and is prevented by the finger f from being drawn below the lower end of said spring.

The looper-thread is controlled by a take-up device consisting of an arm G, attached to the lower end of the pitman b' at the crank b of the shaft B, a stationary plate H, attached to the lower part of the standard A, and co-

operating thread-eyes h, also on said standard. The arm G is forked or bifurcated at its outer end to embrace or pass on both sides of the plate H, and the latter has an arm or portion h¹, having at its upper part a convex edge h', which extends slightly within the concave grooved edge portion h² of the plate H, there being space enough between these convex and concave edges for the passage of the thread, but the latter will be bent enough so that there will be a slight friction or drag thereon when passing between these two edges, one of which is partly housed within the other. Below the parts of the plates H and h¹, one of which is thus partly housed within the other, is an open slot h³, and the thread will be free from drag or friction when therein. The operation of this looper-thread take-up is as follows: When the looper is retreating or making its backward movement, the take-up arm G is, in the rotation of the crank b, projected outward, as denoted by dotted lines in Fig. 6, so as to engage the thread running between the thread eyes or guides h and lift the same, and thus take up the slack occasioned by the backward movement of the looper, said arm G moving inward out of engagement with the thread before the looper has quite completed its backward movement. Before the arm G has become disengaged from the thread the latter has been lifted so as to be between the convex and concave edges h' and h², so that there will be a slight frictional drag thereon when the looper commences its forward movement, this frictional drag, while not amounting to an appreciable tension sufficient to constitute a thread-stop, being check enough on the thread to prevent slack as the looper moves forward and this frictional drag being entirely removed when the thread is drawn downward into the open slot h³.

Owing to the fact that the looper-carrier E is supported on both sides by pivots e², so that power can be directly applied to said looper-carrier centrally thereof, it will be obvious that the said carrier is so firmly supported that there will be no perceptible jar or vibration of the same in its movements, no matter at how high a speed the machine may be run; and this feature of providing supporting pivots or journals on both sides of said carrier on which it can rock therefore contributes largely to the efficiency of my invention as a high-speed and comparatively noiseless machine.

In the operation of an eyed or thread-carrying looper cooperating with the needle in the formation of a double-chain-stitch seam it is necessary that the movements of the looper in the direction of its length should be comparatively long, while the transverse movements of the looper to carry it on opposite sides of the needle are relatively short. My new machine is so organized that the longitudinal movements of the looper are effected by rocking the looper-carrier E on its pivots or

trunnions e^3 , so that there is but little friction in effecting the relatively long longitudinal movements of the latter, while the relatively short transverse movements of the looper-carrier are effected simply by sliding said carrier 5 bodily laterally on its pivots or trunnions, and thus the different necessary movements of the looper-carrier are effected in a strong and positive manner and with a minimum amount of friction.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. In a double-chain-stitch sewing-machine, the combination with a needle and its operating mechanism, of an eyed or thread-carrying looper, a vibrating and transversely-moving looper-carrier consisting of a bell-crank lever, and mechanism for imparting to said 10 looper-carrier rocking movements in the direction of the length of the looper, and sliding movements transverse of the length of the looper, to vibrate the said looper and to move it laterally bodily.

2. In a double-chain-stitch sewing-machine, the combination with a needle and its operating mechanism, of an eyed or thread-carrying looper, a looper-carrier mounted to slide laterally and provided with wings or flanges 15 and with a yoke, and a rotating shaft having a crank working between said wings or flanges, to vibrate said carrier, and an eccentric working in said yoke and thus serving to slide said carrier laterally.

3. The combination, in a double-chain-stitch sewing-machine, of a needle and its operating mechanism, a rotating shaft provided with a crank and an eccentric, the looper-carrier E provided with the looper e , the 20 flanges or wings e^2 embracing said crank, the pivots or trunnions e^3 , and the yoke or opening e^4 embracing said eccentric, and suitable fixed bearings for said pivots or trunnions.

4. In a double-chain-stitch sewing-machine, the combination with the needle and looper 25 and their operating mechanism, of a take-up and controlling mechanism for the lower

thread consisting of the take-up arm G placed within the lower part of the standard A, and bifurcated at its outer end, operating mechanism for said take-up arm, the plate H hav- 30 ing a portion h^4 one edge of which extends slightly within a groove in said plate, to exert a slight frictional drag on the thread, at times, and stationary thread-eyes on opposite sides of and cooperating with said take-up arm and said plate. 55

5. In a double-chain-stitch sewing-machine, the combination with a needle and an eyed or thread-carrying looper and their operating mechanism, of a take-up and thread-controlling device for the needle-thread consist- 60 ing of the fixed bracket F having the horizontally-projecting finger f , the groove f' and the inclined ledge f^2 above said finger, the thread-lifting fin or plate d' and the plates d 65 arranged on opposite sides of said fin or plate d' and provided with thread-eyes which are below the top of the said fin or plate, the latter and the said plates d being connected to the needle-bar to be movable vertically there- 70 with, said thread-eye plates d being arranged to straddle or pass on opposite sides of said finger f , and the said thread-lifting fin or plate d' being arranged to have its outer edge 75 project into the said groove f' , the said finger f being so located relative to the movements of the thread-eye plates d that the eyes of the latter pass a considerable distance below the said finger when the needle-bar is in its 80 lowest position, said plates cooperating with said finger to take up the slack thread and tighten the stitch during the downward movement of the needle-bar, and the said fin or plate d' serving to lift the thread on the up- 85 ward movement of the needle-bar until the top of said fin or plate d' comes opposite the said incline f^2 on the said bracket F.

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

ALBERT RONTKE.

Witnesses:

HENRY CALVER,
J. F. JAQUITH.