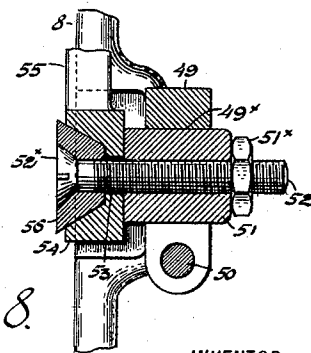
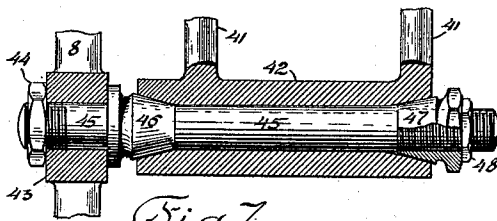
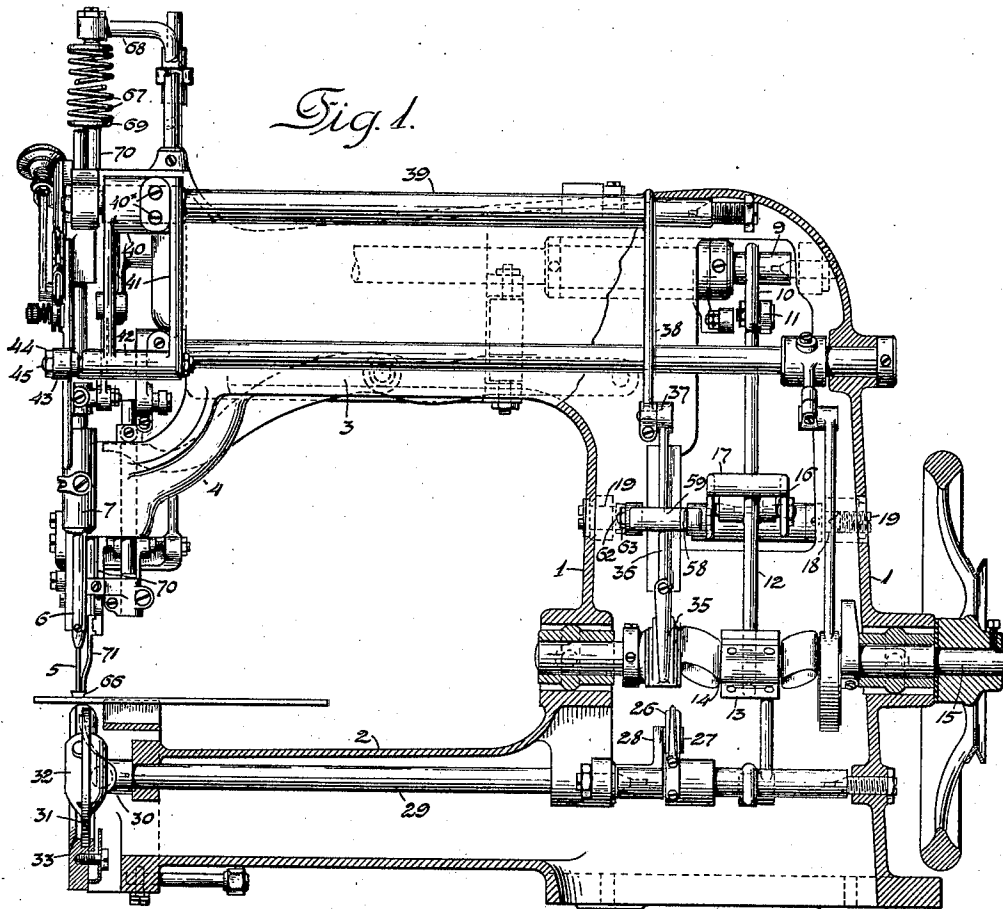


O. E. BROWN.
 NEEDLE MECHANISM FOR SEWING MACHINES.
 APPLICATION FILED MAR. 4, 1910.

1,001,809.

Patented Aug. 29, 1911.

2 SHEETS—SHEET 1.



WITNESSES:

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INVENTOR

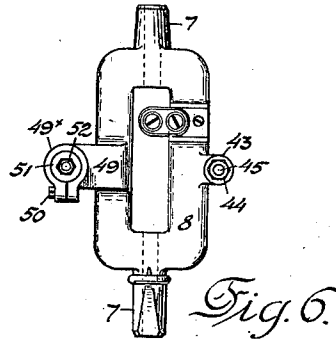
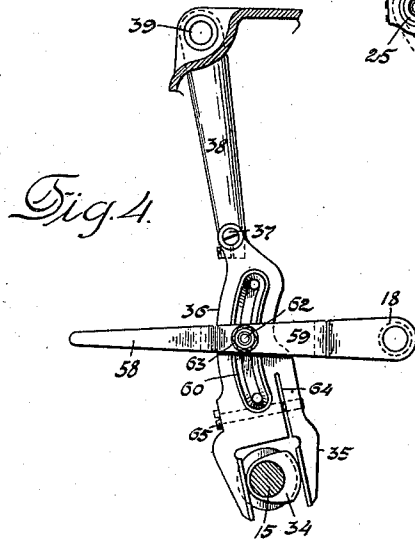
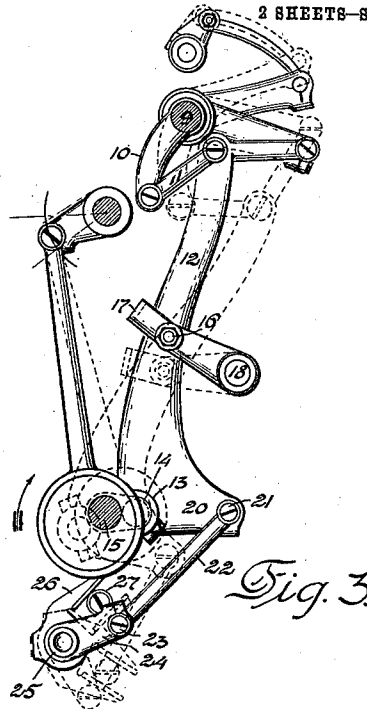
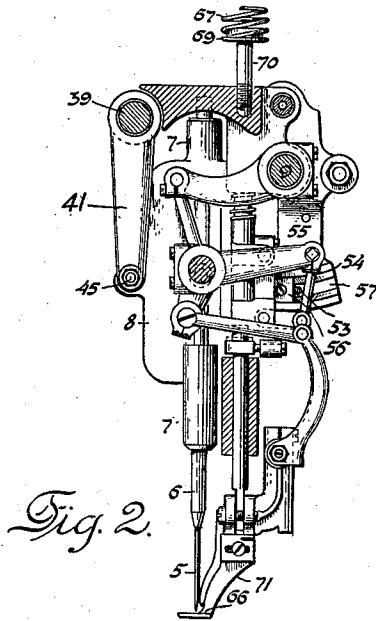
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

OTIS E. BROWN, OF BROCKTON, MASSACHUSETTS, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

NEEDLE MECHANISM FOR SEWING-MACHINES.

1,001,809.

Specification of Letters Patent. Patented Aug. 29, 1911.

Original application filed February 27, 1909, Serial No. 480,338. Divided and this application filed March 4, 1910. Serial No. 547,245.

To all whom it may concern:

Be it known that I, OTIS E. BROWN, a citizen of the United States, residing at Brockton, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Needle Mechanisms for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This application is a division of my application Serial No. 480,338, filed February 27, 1909, and the object of the present invention is to provide a simple and effective means of mounting and laterally jogging the needle-frame of a needle-feed sewing machine.

In its preferred embodiment, the present improvement comprises a reciprocating needle-bar carrying a needle and journaled in the laterally movable needle-frame which is supported at one side by a swinging arm or lever and at the other side by a stud fixed thereon and working in a stationary segmental guideway of substantially the curvature of the path of movement of the connection of said frame with the swinging arm or lever, whereby the frame is maintained parallel with itself throughout its range of lateral movement. One of the supports of said needle-frame is constructed to afford a transverse bearing of sufficient extent to sustain the needle-frame rigidly in its plane of lateral jogging movement. The supporting swinging arm or lever is fixed upon a rock-shaft carrying a second crank-arm pivotally connected to one end of a rock-lever whose other end is formed to embrace a rotary actuating cam, such rock-lever having a fulcrum movable lengthwise thereof by which the degree of oscillation of the rock-shaft, and consequently the amplitude of jog of the needle-frame, is determined.

In the accompanying drawings, Figure 1 is a side elevation of a wax thread sewing machine embodying the present improvements, and Fig. 2 a sectional elevation of the parts above the work-plate representing the head of the bracket-arm in transverse section. Fig. 3 is an elevation of the needle and loop-taker actuating mechanism with certain of the longitudinal shafts in transverse section. Fig. 4 is an elevation and Fig. 5 a plan, partly in section, of a portion of the needle-frame jogging mechanism. Fig. 6 is an elevation showing the needle-

frame and Figs. 7 and 8 are enlarged sectional views representing the connections between the needle-frame and the members by which it is supported.

As represented in the drawings, the frame of the machine comprises the hollow standard 1 with cylindrical work-supporting arm or horn 2 and hollow overhanging bracket-arm 3 terminating in the head 4. The needle 5 is mounted in the reciprocating needle-bar 6 journaled in upper and lower bearings 7 of the laterally movable needle-frame 8. The needle-bar is operatively connected by suitable or well known means with the forward end of the longitudinal rock-shaft 9 which is provided at its rearward end with a depending crank-arm 10 connected by means of a link 11 to the upper end of a link-bar 12 whose lower end is provided with a strap 13 embracing the actuating crank 14 formed in the driving shaft 15 journaled within and transversely of the standard 1 parallel with the needle-actuating rock-shaft 9. The link-bar 12 is journaled intermediate its ends upon the transverse fulcrum-pins 16 mounted in the swinging yoke 17 which is journaled upon the rock-shaft 18 supported by the center-screws 19 carried by the frame of the machine. In following the rotary movements of the actuating crank 14 of the driving shaft, the link-bar 12 moves bodily upon the axis of oscillation of the yoke 17, whereby the upper end of the link-bar connected with the link 11 is moved in a substantially elliptical path with a nearly vertical major axis adjacent the rock-shaft 9.

The lower portion of the link-bar 12 is provided with a rearward offset or extension 20 carrying a stud-screw 21 embraced by one end of a pitman 22 whose opposite end embraces a similar stud-screw 23 carried by a lateral crank-arm 24 of a rock-shaft 25 which is provided with a forked arm 26 embracing a roller-stud 27 carried by the crank-arm 28 upon the rearward end of the shuttle actuating rock-shaft 29 suitably journaled within the work-supporting arm 2 and carrying at its forward end the shuttle-driver 30. The shuttle 31 is of the well known Singer oscillating type, provided with the barrel thread-case 32 and fitted to oscillate within the race 33 at the forward end of the cylinder-arm 2. By the particular arrangement of the link connection 22 with the link-

bar 12 described above, the shuttle movements are timed to cooperate with the needle in the manipulation of the upper thread so as to seize and distend the needle-thread loops while the needle-eye is beneath the work, thus obviating any undue strain upon the thread in the loop-seizing and casting operations which would be produced in case the rise of the needle were hastened or the action of the shuttle upon the needle-thread were delayed.

The driving shaft is provided adjacent the actuating crank 14 with a so-called "triangular" cam 34 formed with outer and inner concentric portions and intermediate eccentric or active portions. This cam is embraced by a yoke 35 formed at the lower end of a rock-lever 36 whose upper end is pivotally connected by means of the screw-stud 37 with the depending crank-arm 38 at the rearward end of a rock-shaft 39 mounted upon the front side of the bracket-arm 3 and having fixed upon its forward end by means of the clamp-screws 40* a depending arm or lever in the form of a crank-frame comprising the hub 40, parallel members 41 and tubular connecting boss 42. The forward edge of the needle-frame is provided with a perforated lug 43 in which is secured by means of the nut 44 the shouldered bearing pin 45 provided near the end adjacent the nut 44 with the bearing cone 46 and having its opposite end threaded to receive the removable bearing cone 47 secured in position thereon by means of the lock-nut 48. The bearing cones 46 and 47 enter the conical extremities of the crank-frame boss 42. As the hub 40 of the crank-frame is comparatively long and is secured rigidly upon the actuating rock-shaft 39, and as the bearing cones 46 and 47 are widely spaced, it will be seen that the needle-frame 8 has ample means for retaining it rigidly in a plane of lateral movement parallel with that in which the crank-frame swings. The needle-frame 8 is provided also with a rearwardly projecting lug 49 having a split socket 49* in which is clamped by means of a screw 50 a bushing 51 with threaded perforation in which is fitted the similarly threaded shank of a stud-screw 52 which passes through a slot 53 in the stationary segmental member 54 of a depending arm 55 of the machine-frame, the stud-screw 52 having its head 52* countersunk in the rearward face of a slide-block 56 fitted to a segmental seat 57 of taper cross-section formed in the member 54. As the fixed segmental seat 57 for the needle-frame slide-block 56 has substantially the same curvature as the arc of movement of the pin 45, it will be observed that in the lateral jogging movements of the frame derived from the cam 34 its parallelism will be maintained.

The stitch-regulating lever 58 has one end

integral with the rock-shaft 18, and its other end projects forwardly through a suitable aperture in the standard 1 at the front side of the machine for convenient access of the operator, while its intermediate portion is divided or yoked at 59 to embrace the central portion of the vibrating lever 36, which latter is formed in opposite sides with segmental grooves 60 of V-shaped cross-section entered by correspondingly shaped fulcrum-blocks 61 formed with conical apertures which are entered by the conical points of the center-screws 62 mounted in the opposite members of the yoke portion of the lever 58 and locked in place by the nuts 63. The position of the lever 58 determines the location of the fulcrum-points 62 upon which the lever 36 vibrates, and hence determines the range of lateral movement in the line of seam of the needle-frame and the needle.

The rock-lever 36 has a longitudinal slit 64 extending upwardly from one side of the yoke 35, and is provided with a transverse adjusting screw 65 passing through the split lower portion of the rock-lever for taking up any lost motion between the operative faces of the yoke member and the cam 34 as the parts become worn by continued use. The feed-cam 34 is so fixed upon the shaft as to cause the lateral or feeding movements to be imparted to the needle while still in the work after the needle-thread loop has been seized by the shuttle.

The presser-foot 66 is in practice formed with the usual elongated needle-hole and is provided with automatic lifting means whereby it is disengaged from the work during the feeding movements of the needle, but is permitted to normally remain in operative position under the action of the spring 67 interposed between the rigid arm 68 and the disk 69 upon the upper end of the presser-bar 70 to which the shank 71 of the presser-foot is attached.

To provide lateral adjustment for the needle relatively to the shuttle, the clamp-screw 50 of the split socket 49* is first loosened to release the bushing 51, after which the clamp-screws 40* are withdrawn and the crank-frame 40 41 42 is shifted upon its supporting rock-shaft 39, which serves to move the needle-frame 8 bodily transversely of the direction of feed, after which the clamp-screws 40* are retightened and the bolt 50 is again tightened to clamp the bushing 51 securely in its socket. In order to take up any wear between the block 56 and its segmental guide-way 54, the jam-nut 51* of the stud-screw 52 is loosened and the latter is adjusted in the threaded aperture therefor of the bushing 51, after which the jam-nut 51* is returned to initial operative position in engagement with the end of the bushing.

Having thus set forth the nature of the invention, what I claim herein is:—

1. In a sewing machine, the combination with stitch-forming mechanism comprising a reciprocating needle-bar carrying a needle, and a cooperating loop-taker, and means for imparting operative movements to said needle and loop-taker, of a laterally movable frame in which said needle-bar is journaled to reciprocate, a rock-shaft, means for actuating the same, a crank-arm fixed upon said rock-shaft and having a pivotal connection with said needle-frame, a stud mounted upon said needle-frame and provided with a slide-block, and a fixed segmental slide-way having a curvature substantially the same as the path of movement of said pivotal connection of the frame with the crank-arm and to which said slide-block is fitted.

2. In a sewing machine, the combination with stitch-forming mechanism comprising a reciprocating needle-bar carrying a needle and a cooperating loop-taker, and means for imparting operative movements to said needle and loop-taker, of a laterally movable frame in which said needle-bar is journaled to reciprocate, a rock-shaft, means for actuating the same, a crank-arm fixed upon said rock-shaft and having a pivotal connection with said needle-frame, a split bearing carried by said needle-frame, a bushing fitted to said split bearing, a screw-stud secured within said bushing and provided with an enlarged head, a slide-block fitted upon the head of said screw-stud and provided with bearing faces convergent toward the adjacent end of said bushing, and a segmental slide-way fitted to the bearing faces of said slide-block and formed with an intermediate aperture entered by said screw-stud, said segmental slide-way being formed with a curvature substantially the same as that of the path of movement of the pivotal connection of the needle-frame with said crank-arm.

3. In a sewing machine, the combination with stitch-forming mechanism comprising a reciprocating needle-bar carrying a needle, a cooperating loop-taker, and means for imparting operative movements to said needle and loop-taker, of a laterally movable frame in which said needle-bar is journaled to reciprocate, a rock-shaft, means for actuating the same, a crank-arm fixed upon said rock-shaft, a pivotal connection intermediate said crank-arm and one edge of the needle-frame, a fixed segmental guide-way disposed in a plane parallel with the plane of movement of said crank-arm and having a curvature substantially the same as that of the path of movement of said pivotal connection, and a sliding connection between the opposite edge of said needle-frame and the segmental slide-way.

4. In a sewing machine, the combination

with the frame comprising a work-supporting member and an overhanging bracket-arm, a needle-actuating shaft journaled in the bracket-arm, and stitch-forming mechanism including a reciprocating needle-bar carrying a needle, a cooperating loop-taker, and means for imparting operative movements to said needle and loop-taker, of a laterally movable frame mounted upon the bracket-arm and in which said needle-bar is journaled to reciprocate, a rock-shaft mounted upon and extending longitudinally of the bracket-arm, a crank-arm upon the forward end of said rock-shaft, an operative connection between said crank-arm and the needle-frame for imparting jogging movements to the latter, a second crank-arm upon the rearward end of said rock-shaft, a rotary cam, a vibrating lever pivotally connected at one end to and suspended upon the second arm of said rock-shaft and at the opposite end embracing said cam, a fulcrum-pin engaging said lever intermediate its ends, and means for shifting said fulcrum-pin lengthwise of said lever.

5. In a sewing machine, the combination with the frame comprising a work-supporting member and an overhanging bracket-arm, a needle-actuating shaft journaled in the bracket-arm, and stitch-forming mechanism including a reciprocating needle-bar carrying a needle, a cooperating loop-taker, and means for imparting operative movements to said needle and loop-taker, of a laterally movable frame mounted upon the bracket-arm and in which said needle-bar is journaled to reciprocate, a rock-shaft mounted upon and extending longitudinally of the bracket-arm, a crank-arm upon the forward end of said rock-shaft, an operative connection between said crank-arm and the needle-frame for imparting jogging movements to the latter, a second crank-arm upon the rearward end of said rock-shaft, a rotary cam, a vibrating lever pivotally connected at one end to and suspended upon the second arm of said rock-shaft and at the opposite end embracing said cam and provided intermediate the ends of its opposite faces with segmental seats arranged lengthwise thereof, a pivotally mounted fulcrum-carrying lever, fulcrum-blocks fitted to the segmental seats of said vibrating lever, and means carried by said fulcrum-carrying lever for sustaining said fulcrum-blocks in operative relation with their respective segmental seats.

6. In a sewing machine, the combination with stitch-forming mechanism comprising a reciprocating needle-bar carrying a needle, a cooperating loop-taker, and means for imparting operative movements to said needle and loop-taker, of a laterally movable frame in which said needle-bar is journaled to reciprocate, a rock-shaft, an operative

connection intermediate said rock-shaft and the needle-frame for imparting a jogging motion thereto, a second crank-arm upon said rock-shaft, a rotary cam, a vibrating lever pivotally connected at one end with the second arm of said rock-shaft and forked at the opposite end to embrace said cam and provided intermediate the ends in opposite faces with longitudinally arranged segmental seats, a pivotally mounted fulcrum-carrying lever, divided or yoked intermediate its ends to embrace said vibrating lever, inwardly projecting conical pointed fulcrum-

screws carried by the spaced members of said fulcrum-carrying lever, and slide blocks formed with conical cavities fitted to the points of said fulcrum-screws and exteriorly fitted to the segmental seats in said vibrating lever.

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

OTIS E. BROWN.

Witnesses:

HENRY J. MILLER,

H. A. KORNEMANN, Jr.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
