

No. 865,324.

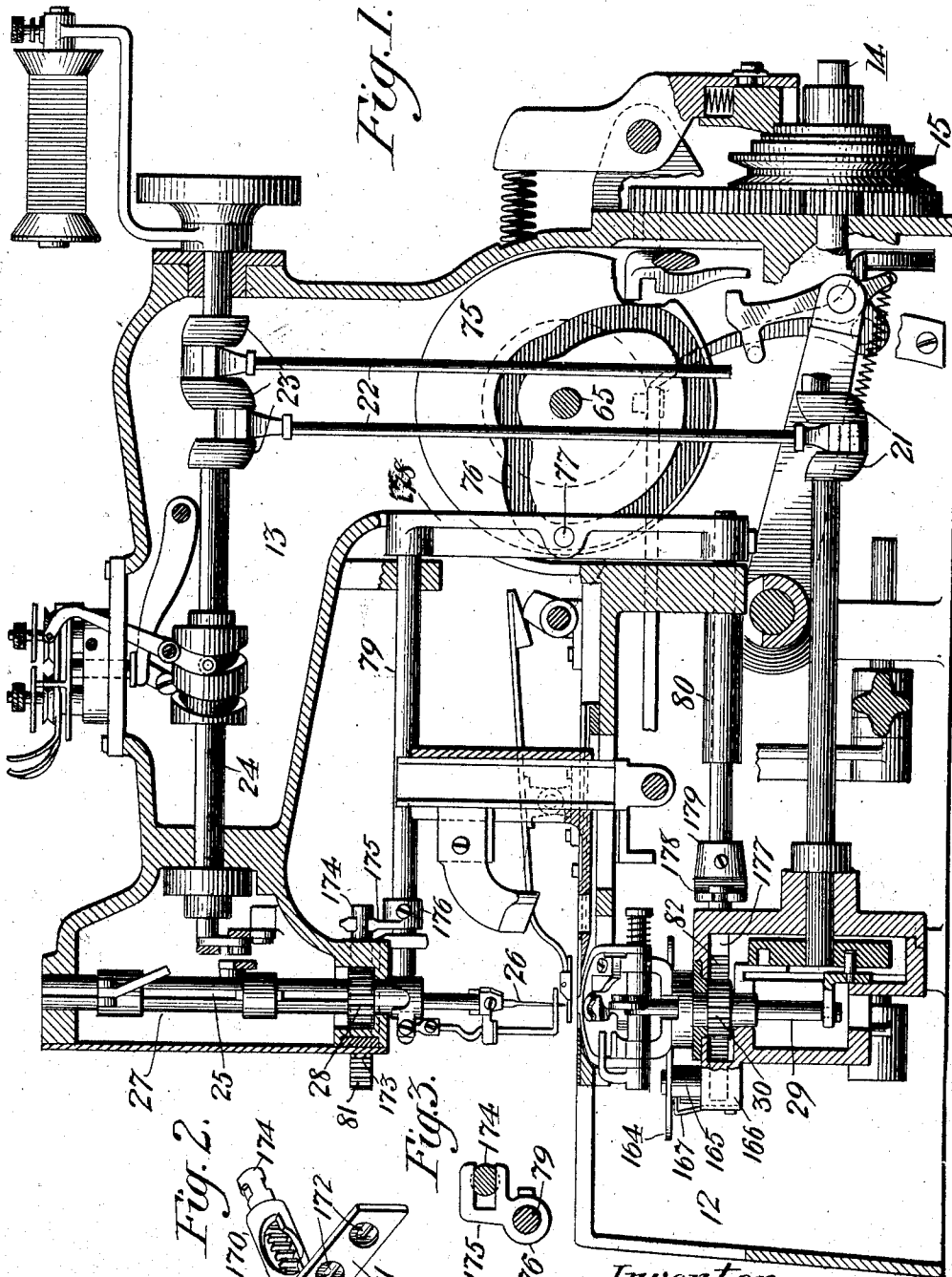
E. B. ALLEN.

PATENTED SEPT. 3, 1907.

BUTTONHOLE STITCHING MACHINE.

APPLICATION FILED OCT. 30, 1906.

2 SHEETS—SHEET 1.



Witnesses
D. W. Edlin.
C. M. Sweeney

Inventor:
Edward B. Allen
Attorney.

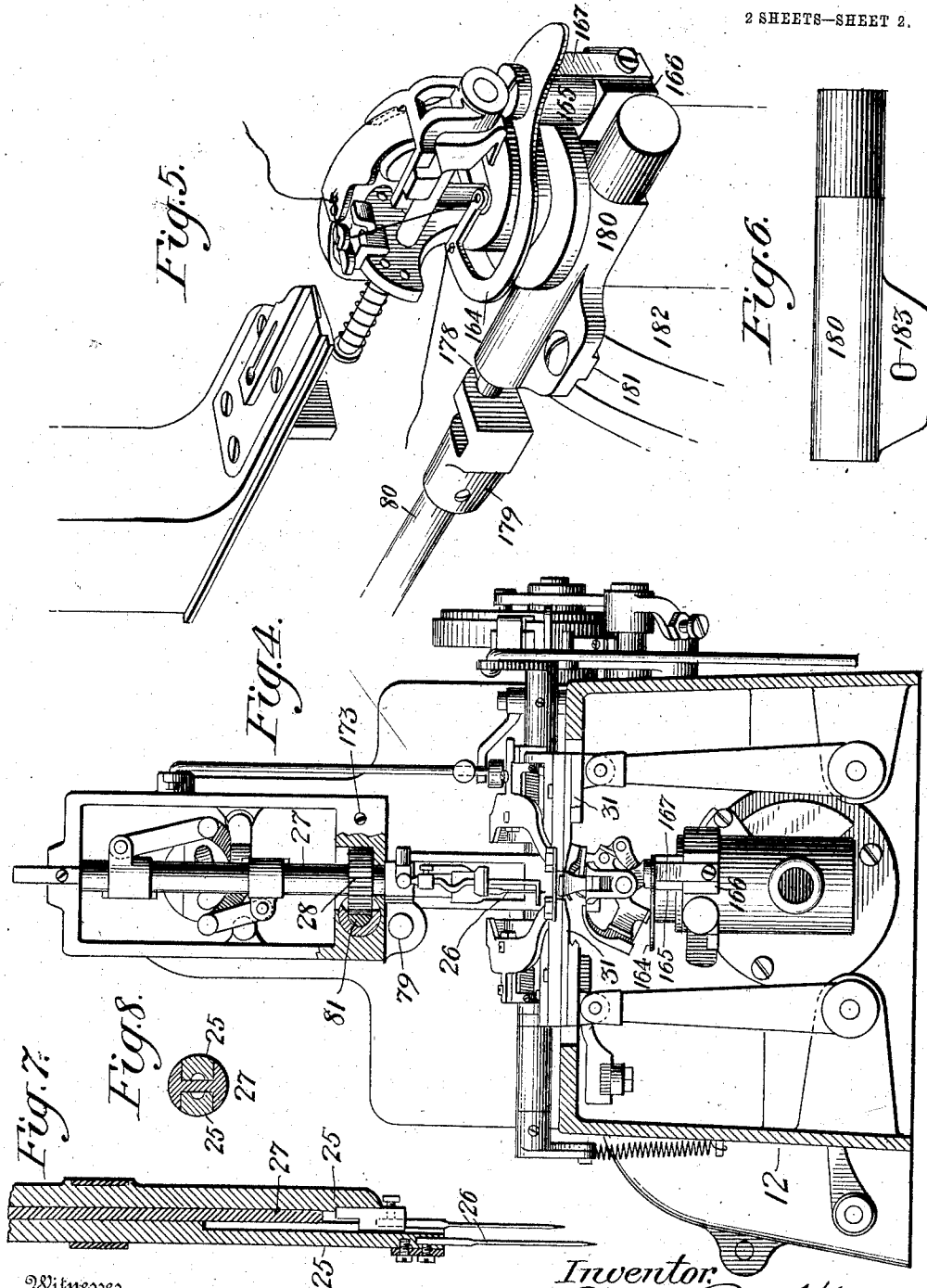
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D. W. Edlin
C. H. Sweeney

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Inventor.
Edward B. Allen
Henry K. Allen
Attorney.

UNITED STATES PATENT OFFICE.

EDWARD B. ALLEN, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

BUTTONHOLE-STITCHING MACHINE.

No. 865,324.

Specification of Letters Patent.

Patented Sept. 3, 1907.

Original application filed March 7, 1906, Serial No. 304,732. Divided and this application filed October 30, 1906. Serial No. 341,203.

To all whom it may concern:

Be it known that I, EDWARD B. ALLEN, a citizen of the United States, formerly of Elizabeth, New Jersey, but now residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented or discovered certain new and useful Improvements in Buttonhole-Stitching Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates more particularly to the stitch-forming mechanism of button-hole stitching machines, and has for its object to improve the mechanism by which periodical turning movements are imparted to the stitch-forming devices, and to render more convenient for use a cord guide arranged beneath the throat-plate or work-support of the machine, and by which a stay-cord or gimp is directed to the work in such a manner as to be stitched into the edges of the button-holes.

The present invention is embodied in a buttonhole cutting and stitching machine the construction and operation of which are fully set forth in my application No. 304,732, filed March 7, 1906, and of which this case is a division.

Referring to the drawings, Figure 1 is a vertical longitudinal section of a buttonhole machine embodying the present invention, and Figs. 2 and 3 are detail views of the means for adjusting and taking up wear of the operating racks of the turning stitch-forming devices. Fig. 4 is a front end view of the machine with the face-plate of the head removed and with the front end of the machine base in section. Fig. 5 is a detail perspective view illustrating the swinging cord-guide and showing a part of the operating mechanism for the stitch-forming devices. Fig. 6 is a detail plan view of the bearing or guide for the lower rack. Figs. 7 and 8 are detail sectional views of the rotating needle-bar guide and needle-bars.

Referring to the drawings, 12 denotes the base of the machine and 13 the bracket-arm surmounting said base, said parts constituting the stationary frame of the machine on which the stitch-forming devices are preferably rotatively mounted, so as to be adapted to be turned, and on which the work-supporting and button-hole cutting devices are movably mounted. Journaled in the said base 12 is the main or driving shaft 14 on which is loosely mounted the driving pulley 15 having a suitable clutch connection with said shaft.

The driving shaft 14 is constructed with twin quartering cranks 21 connected by pitmen 22 with similar cranks 23 on the rotating needle-bar shaft 24 journaled in the upper part of the arm and provided at its forward end with cranks connected by pitmen with two out-of-time needle-bars 25 carrying needles 26, said needle-

bars being operated in the manner fully set forth in U. S. Patent No. 739,132, granted Sept. 15, 1903. The needle-bars 25 reciprocate vertically in a rotatable guide 27 suitably mounted in the head of the machine, as fully set forth in U. S. Patent No. 734,794; granted July 28, 1903, and said guide is provided with a pinion 28 by which it may be rotated.

The loop-taking devices coöperating with the needles 26 are operatively connected with the forward end of the shaft 14 and are preferably the same in construction and operation as the loop-taking devices fully shown and described in said U. S. Patent No. 734,794, said loop-taking devices being mounted on a rotatable carrier 29 provided with a pinion 30 by which it may be turned.

The intermittingly rotating feed-shaft 65 carries a cam-wheel 75 having a cam-groove 76 entered by a pin or stud 77 on a vertical bar 78 to which are attached the sliding-rods 79 and 80 which are connected, respectively, with the pinions 28 and 30 by means of which the needles and loopers are rotated in stitching portions of the eyes of the button-holes and in barring. The pin or stud 77 is preferably located in the middle of the length of the vertical bar 78, or about midway between the rods 79 and 80, so that parallel, equal and steady sliding movements, without tendency to bind, will be imparted to the said rods 79 and 80 secured to the opposite ends of said bar; and owing to the fact that the said pin or stud 77 fits closely in said cam-groove 76 the racks 81 and 82 will be positively operated in both directions and the turning movements of the stitching devices will always be positively controlled and steadied by the said cam-groove with which they are connected and from which they are operated.

If the button-holes are to be corded, to strengthen the same, a cord-guide to direct a cord to the work from beneath is preferably provided. The present machine comprises a cord-guide 164 arranged beneath the work-support 31 and carried by a block 165 pivotally mounted on a support 166 adjacent to the looper mechanism, said pivotally mounted block being preferably pressed against by a retaining spring 167 which serves to hold the cord-guide in working position; but as the said guide, when in such working position, can be threaded only with considerable difficulty, it is pivotally mounted so that its inner end may be swung outward for threading, when this is necessary, and may then be swung back to its working position in which it will be held by the retaining spring 167.

By reference to Fig. 5 it will be seen that the guiding portion or inner eye of the cord guide is, when the cord guide is in working position, approximately concentric with the lower rotary stitch-forming devices, so as properly to direct the cord to the throat-plate

above; and when the said cord guide is to be threaded it is displaced from its concentric working position by being swung outward, as above stated.

The racks 81 and 82, which operate the pinions 28 and 30 which impart periodical turning movements to the needles and loopers, are preferably adjustably connected with the sliding rods 79 and 80 by which said racks are operated, and said racks are also preferably so mounted as to be slightly adjustable laterally relative to said pinions for the purpose of taking up wear. To this end the upper rack 81 is mounted to slide in a sleeve 170 rigid with a plate or arm 171 attached to the head of the machine, and which plate or arm 171 is provided with holes or slots 172 through which the shanks of the attaching screws 173 pass with sufficient looseness to permit the said plate or arm, and the sleeve 170 rigid therewith, to be adjusted slightly so as to move said sleeve toward said pinion when wear is to be taken up; the recess in the machine head, which receives said sleeve, being sufficiently large to permit of such adjustment of said sleeve. The rear end of the rod 174, on which the said rack 81 is formed, is notched on both sides to form a flattened portion embraced by a fork 175 rigid with a collar 176 adjustably attached to the sliding rod 79, so that the position of said collar on said rod may be varied to secure the proper timing or adjustment of the pinion 28 and of the needle-bar guide 27 to which said pinion is attached. Also the rod 177 on which the lower rack 82 is formed is notched on both sides at its rear end, similar to the rod 174, and the flattened portion of the said rod 177 is embraced by a fork 178 rigid with a collar 179 adjustably attached to the sliding rod 80, so that the timing or adjustment of the pinion 30, from which the turning movements of the looping devices are derived, may be readily effected by varying the position of the said collar 179 on said rod 80. The rack-rod 177 slides in a bearing plate or guide 180 having an adjustable tongue-and-groove connection, as at 181, with a support or block 182 rigid with the machine base, said plate having a slot or hole 183 through which the shank of its attaching screw loosely passes to permit the position of said plate to be varied slightly for the purpose of taking up wear between said rack 82 and said pinion 30.

It will of course be understood that the present invention is not limited to the details herein shown and described, as such details may be varied widely without departing from the spirit of the invention.

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

1. In a button-hole stitching-machine, the combination with upper and lower stitch-forming devices rotatively mounted on the machine frame, of pinions for periodically turning said stitch-forming devices, sliding racks for engaging said pinions, sliding rods for operating said racks, a vertical bar to which said sliding rods are attached, a stud or pin on said vertical rod midway between said sliding rods, or approximately so, to impart equal and parallel movements to said rods without tendency to bind, and a grooved operating cam entered by said stud or pin and by which positive rotating movements in both directions will be imparted to said stitching devices.

2. In a button-hole stitching-machine, the combination with upper and lower stitch-forming devices rotatively mounted on the machine frame, of pinions for periodically turning said stitch-forming devices, sliding racks for oper-

ating said pinions, sliding rods with which said racks are adjustably connected, and means for operating said sliding rods.

3. In a button-hole stitching-machine, the combination with upper and lower stitch-forming devices rotatively mounted on the machine frame, of pinions for periodically turning said stitch-forming devices, sliding racks for operating said pinions, sliding rods with which said racks are connected, adjustable guides in which said racks are mounted, and means for operating said sliding rods.

4. In a button-hole stitching machine, the combination with work-holding and upper and lower stitch-forming devices, of a cord-guide movably mounted beneath the work-support of the machine so that it may be displaced from working position for convenience in threading, said cord-guide having a guiding portion which is approximately concentric with said lower stitch-forming devices when said cord guide is in working position.

5. In a button-hole stitching machine, the combination with work-holding and upper and lower stitch-forming devices, of a cord-guide movably mounted beneath the work-support of the machine so that it may be displaced from working position for convenience in threading, and means for holding said cord-guide in working position, said cord-guide having a guiding portion which is approximately concentric with said lower stitch-forming devices when said cord guide is in working position.

6. In a button-hole stitching machine, the combination with work-holding and upper and lower stitch-forming devices, of a cord-guide pivotally mounted beneath the work-support so that it may be swung outward horizontally for convenience in threading, said cord-guide having a guiding portion which is approximately concentric with said lower stitch-forming devices when said cord-guide is in working position.

7. In a button-hole stitching machine, the combination with work-holding and upper and lower stitch-forming devices, of a cord-guide pivotally mounted beneath the work-support so that it may be swung outward horizontally for convenience in threading, and a spring for holding said cord-guide in working position, said cord-guide having a guiding portion which is approximately concentric with said stitch-forming devices when said cord-guide is in working position.

8. In a button-hole stitching machine, the combination with stitch-forming and work-holding devices, of a pivotally mounted block 165, the cord-guide 164 consisting of a horizontally swinging arm extending beneath the work-support and having a cord-guiding eye at its inner end, said arm being mounted on said block, and a spring pressing against said block and serving to hold said cord-guide in working position.

9. In a button-hole stitching-machine, the combination with upper and lower stitch-forming devices rotatively mounted on the machine frame, of pinions for periodically turning said stitch-forming devices, sliding racks for operating said pinions, sliding rods with which said racks are adjustably connected, adjustable guides in which said racks are mounted, and means for operating said sliding rods.

10. In a button-hole stitching-machine, the combination with upper and lower stitch-forming devices rotatively mounted on the machine frame, of pinions for periodically turning said stitch-forming devices, sliding racks for engaging said pinions, sliding rods for operating said racks and to which rods said racks are adjustably attached, a vertical bar to which said sliding rods are attached, a stud or pin on said vertical rod midway between said sliding rods, or approximately so, to impart equal and parallel movements to said rods without tendency to bind, and a grooved operating cam entered by said stud or pin and by which positive rotating movements in both directions will be imparted to said stitching devices.

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

EDWARD B. ALLEN.

Witnesses:

E. W. OSTROM,
E. L. TOLLES.