No. 809,661. PATENTED JAN. 9, 1906.

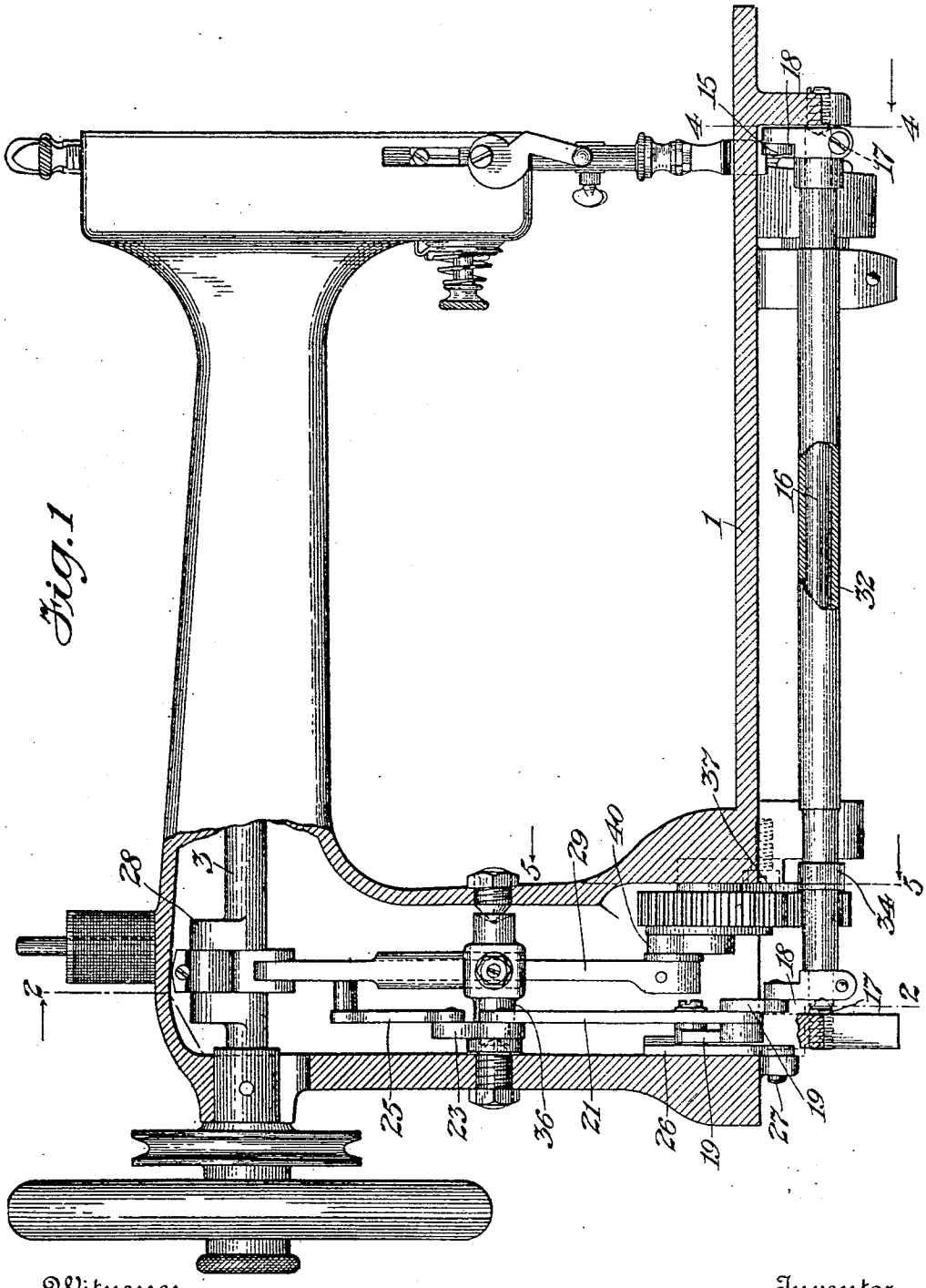
W. M. AMMERMAN.

FEEDING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED MAY 4, 1904.

3 SHEETS—SHEET 1.

Fig. 1



Witnesses
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3 SHEETS—SHEET 2.

Fig. 3

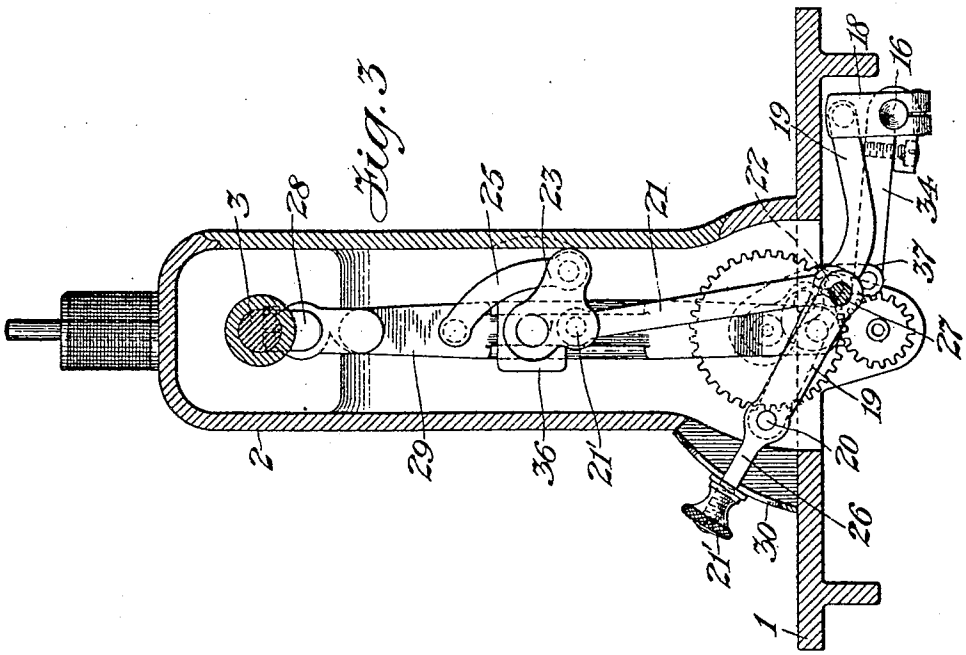
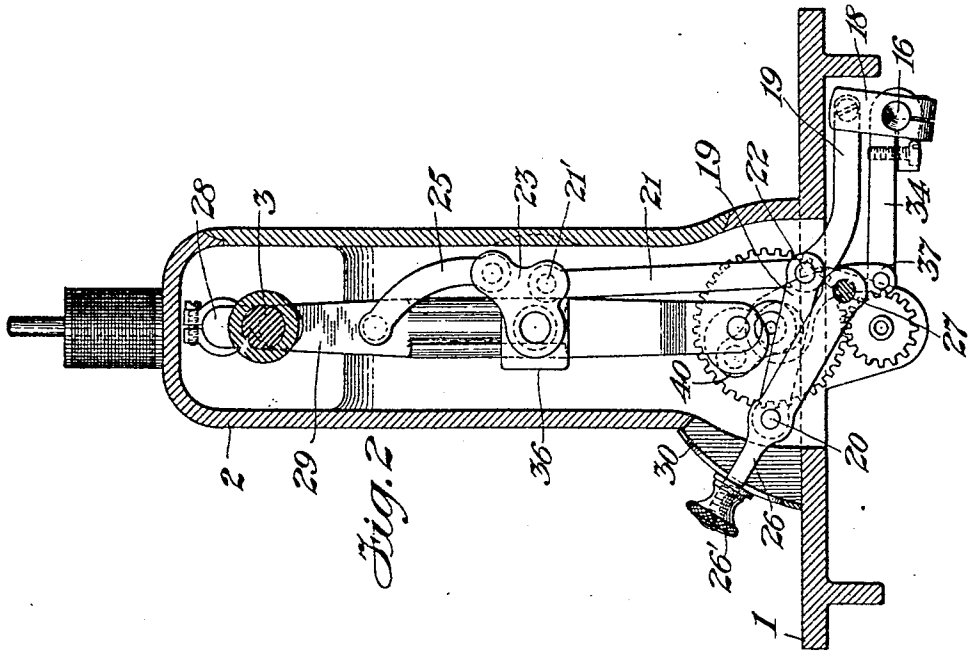


Fig. 2



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3 SHEETS—SHEET 3.

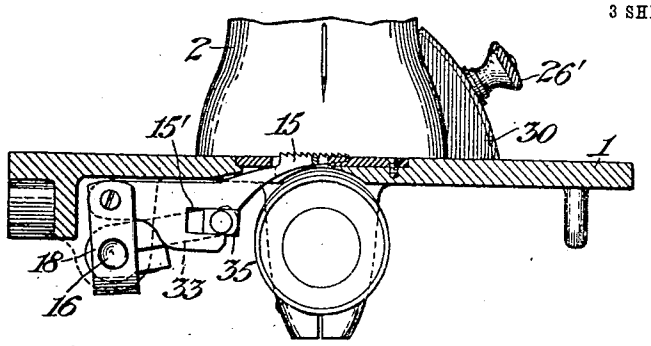

Fig. 4

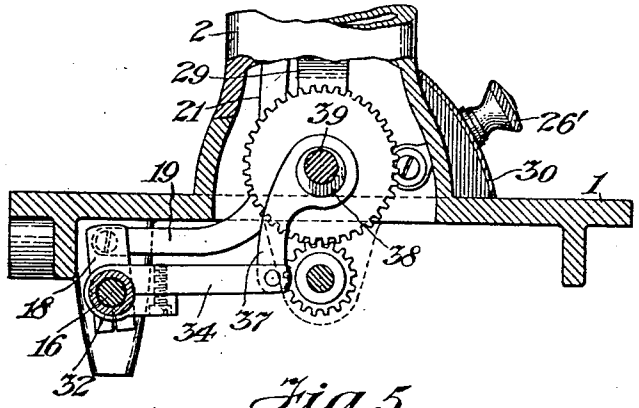

Fig. 5

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UNITED STATES PATENT OFFICE.

WILLIAM M. AMMERMAN, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE EDWIN J. TOOF COMPANY, OF NEW HAVEN, CONNECTICUT, A CORPORATION OF NEW JERSEY.

FEEDING MECHANISM FOR SEWING-MACHINES.

No. 809,661. Specification of Letters Patent. Patented Jan. 9, 1906.

Application filed May 4, 1904. Serial No. 206,290.

To all whom it may concern:

Be it known that I, WILLIAM M. AMMERMAN, a citizen of the United States, and a resident of New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Feeding Mechanism for Sewing-Machines, of which the following is a specification.

This invention has for its object to provide an improved feeding mechanism for sewing-machines that will coöperate with the several other parts of the stitch-forming mechanism in such time as to perform its function without causing undue strain or pull on the thread or any of the coöperating parts and that will also be so constructed and organized as to assure the greatest ease of operation, and thereby increase the light-running qualities of the machine of which it may form a part. This object I attain by means of the novel construction and combination of parts, as hereinafter set forth in detail, and pointed out in the claims.

Referring to the accompanying drawings, forming a part of this specification, Figure 1 is a rear elevation of a sewing-machine embodying my invention with certain parts thereof broken away and in section. Fig. 2 is a vertical section through line 2 2 of Fig. 1 looking in the direction indicated by the arrows. Fig. 3 is a similar view showing the position of the parts at a different time during the operation of the machine. Figs. 4 and 5 are transverse sections through lines 4 4 and 5 5, respectively, of Fig. 1 looking in the direction indicated by the arrows.

Similar reference characters designate like parts in all the figures of the drawings.

The frame of the machine illustrated in the drawings, comprising the bed-plate 1 and its attached bracket-arm 2, is of usual construction. Adjacent to the front end of the said bed-plate 1 and in usual position is the feed device proper, (indicated at 15.) This feed device is actuated to receive its forward and backward or horizontal movement from a rock-shaft 16, which is mounted on cone-bearings 17 17 at the under side of the bed-plate and provided with two crank-arms 18 18 at or adjacent to its opposite ends, one of which arms is pivotally connected with the rear end of the said feed device, as most clearly shown in Fig. 4, and the other of which is connected with one of a pair of toggle-links 19 19, the other of which latter is connected with a fulcrum-pin 20. A vertically-arranged link 21 connects at its lower end with the said toggle-links at their connecting or toggle joint 22 and at its opposite or upper end connects with one end of a bell-crank lever 23, which is mounted upon a fulcrum-support 36, attached to the bracket-arm 2, the said bell-crank lever 23 being connected at its other end through the medium of a link 25 with a reciprocatory actuating device, herein shown as a pitman-lever 29, forming part of the shuttle-actuating mechanism, the said pitman-lever being connected at its upper end with a crank 28 in the upper driving-shaft 3 and sliding through an opening in the said fulcrum-support 36, as more fully described in my pending application, Serial No. 198,184, filed March 15, 1904. By the arrangement and combination of parts as described movement of the pitman 29 communicates a rocking movement to the lever 23 through the link 25, and said lever in turn causes a vertical reciprocation of the link 21 which raises and lowers the connecting toggle-links at their junction, and thereby rocks the shaft 16 and causes horizontal movement of the feed. To provide for the adjustment of this horizontal movement of the feed, the fulcrum-pin 20, with which one of the toggle-links connects, is carried by a lever 26, termed the "stitch-regulator," which is pivoted at one end upon a stationary pivot 27, attached to the bed-plate, and at its opposite end projects through a slot in the bracket-arm and is provided with a clamping-nut 26', which coacts with an arc-plate 30 on the bed-plate to secure the stitch-regulator in any desired position. By raising or lowering the outer end of this stitch-regulator the position of the fulcrum-pin 20, carried thereby, is so changed as to cause the connected toggle-links at their junction to swing or move at a greater or less angle to a vertical line when operated by the link 21 and so increase or diminish the longitudinal movement of that toggle-link which connects with the crank-arm of the rock-shaft 16, and thereby vary the throw of the latter and the connected feed device accordingly.

By operating the feed-shaft 16 from the pitman-lever 29 of the shu' le-actuating

mechanism in the manner described instead of from a second crank or equivalent device on the driving-shaft the connections between the upper and lower shafts are both simplified and lightened, whereby the machine will be caused to run with greater ease and also with less noise and vibration. Moreover, by making a direct connection between the feed and shuttle mechanisms in the manner described the parts can be more readily and accurately assembled than if independent connections were effected between said mechanisms and the driving-shaft and also with less possibility of the parts subsequently getting out of adjustment.

The vertical or up-and-down movement of the feed is effected in the present case by the following means: A tubular rock-shaft 32 is mounted on the horizontal shaft 16 and is provided with two crank-arms 33 and 34, located adjacent to its opposite ends, the arm 33 at the front end of the shaft having a pivotally-mounted block 35 therein, engaging with the feed device within a slot 15′ therein, as most clearly shown in Fig. 4, and the arm 34 at the rear end of said shaft having connection with the lower end of a pitman 37, which connects at its upper end with an actuating cam or eccentric 38 in a short rotating shaft 39, as most clearly shown in Fig. 5, the said shaft 39 being actuated by the pitman-lever 29 through the medium of a crank-arm 40 on said shaft, with which the lower end of the pitman-lever is pivotally connected. Vertical reciprocation of the pitman 37 as caused by the eccentric 38 imparts a rocking movement to the shaft 32, and thereby an up-and-down movement to the end of its arm 33, which is imparted to the connected feed device.

The construction and organization of the several parts constituting the feeding mechanism as described assures the desired and proper coöperation of the same with the other parts of the stitch-forming mechanism, the action of the feed device being such that it does not begin its forward or working stroke until the shuttle has ceased drawing the thread through the work and cast off the thread-loop to be drawn up by the take-up and then remains in operative engagement with the work only when the needle is raised above and disengaged therefrom.

The desired timing in the action of the feed whereby it will not engage the work until after the needle has raised from engagement therewith is secured by that construction and organization of the feed-actuating parts whereby the bell-crank lever 23 just prior to the raising of the feed into engagement with the work is moved to the position shown in Fig. 3, with the point of connection 21′ between it and the link 21 at or adjacent to a dead-center, at which position of the parts the movement of the feed will be arrested sufficiently to permit the raising of the needle above the work and also a substantially straight upward movement of the feed into engagement with the work.

What I claim is—

1. In a sewing-machine, a feed device, means for imparting a horizontal movement to said feed device comprising a reciprocatory actuating device, a rock-shaft having two arms one of which is connected with the feed device, a toggle having connection with the second rock-shaft arm, and means including a pivoted lever and a plurality of links operatively connecting the said actuating device and the said toggle, and means for imparting a vertical movement to the feed device.

2. In a sewing-machine, a feed device, means for imparting a horizontal movement to said feed device comprising a reciprocatory actuating device, a rock-shaft having two arms one of which is connected with the feed device, a toggle having connection with the second rock-shaft arm, and a pivoted lever having its opposite ends operatively connected through the medium of links with the said actuating device and the said toggle respectively, and means for imparting a vertical movement to the feed device.

3. In a sewing-machine, a feed device, means for imparting a horizontal movement to said feed device comprising a driving-shaft, a pitman-lever operated from said shaft, a rock-shaft having two arms, one of which is connected with the feed device, a toggle having connection with the second rock-shaft arm, and a pivoted lever having connection with the pitman-lever through the medium of a link and also having connection with said toggle through the medium of a second link, and means for imparting a vertical movement to the feed device.

4. In a sewing-machine, a feed device, means for imparting a horizontal movement to said feed device comprising a driving-shaft, a pitman operated from said shaft and forming part of the shuttle-actuating mechanism, a rock-shaft having two arms one of which is connected with the feed device, a toggle having connection at one end with the second arm of the rock-shaft and at its opposite end having connection with an adjustable support, and a pivoted lever having one arm thereof connected with the said pitman through the medium of a link and its other arm connected with the said toggle through the medium of a second link, and means for imparting a vertical movement to the feed device.

5. In a sewing-machine, a feed device, means for imparting a horizontal movement to said feed device comprising a rock-shaft having two arms one of which is connected with the feed device, a toggle having connection with the second rock-shaft arm, a pivot-

ed lever having connection with said toggle through the medium of a link, and means for actuating said lever and moving the same and the connected link to and from a position at or adjacent to a dead-center, and means for imparting a vertical movement to the feed device.

Signed at New York, in the county of New York and State of New York, this 8th day of April, A. D. 1904.

WILLIAM M. AMMERMAN.

Witnesses:

CHAS. F. DANE.

E. M. FAITH.