

2 Sheets—Sheet 1.

FEEDING MECHANISM FOR SEWING MACHINES.

Patented Apr. 9, 1889.

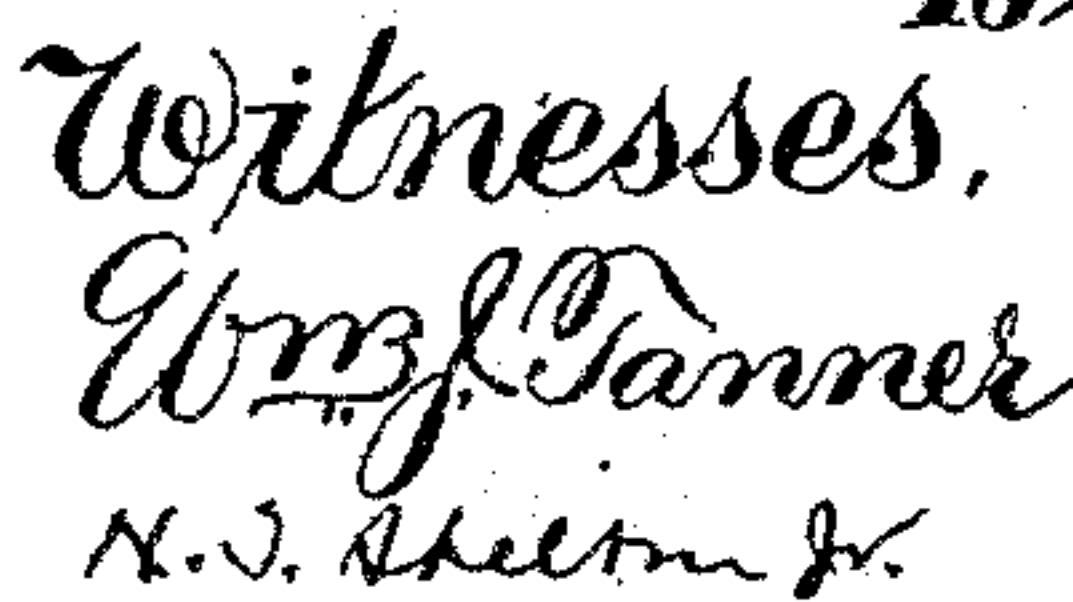


Fig. 2.

Inventor.

12 Francis J. Leilich
by his attorney S. H. Hubbard

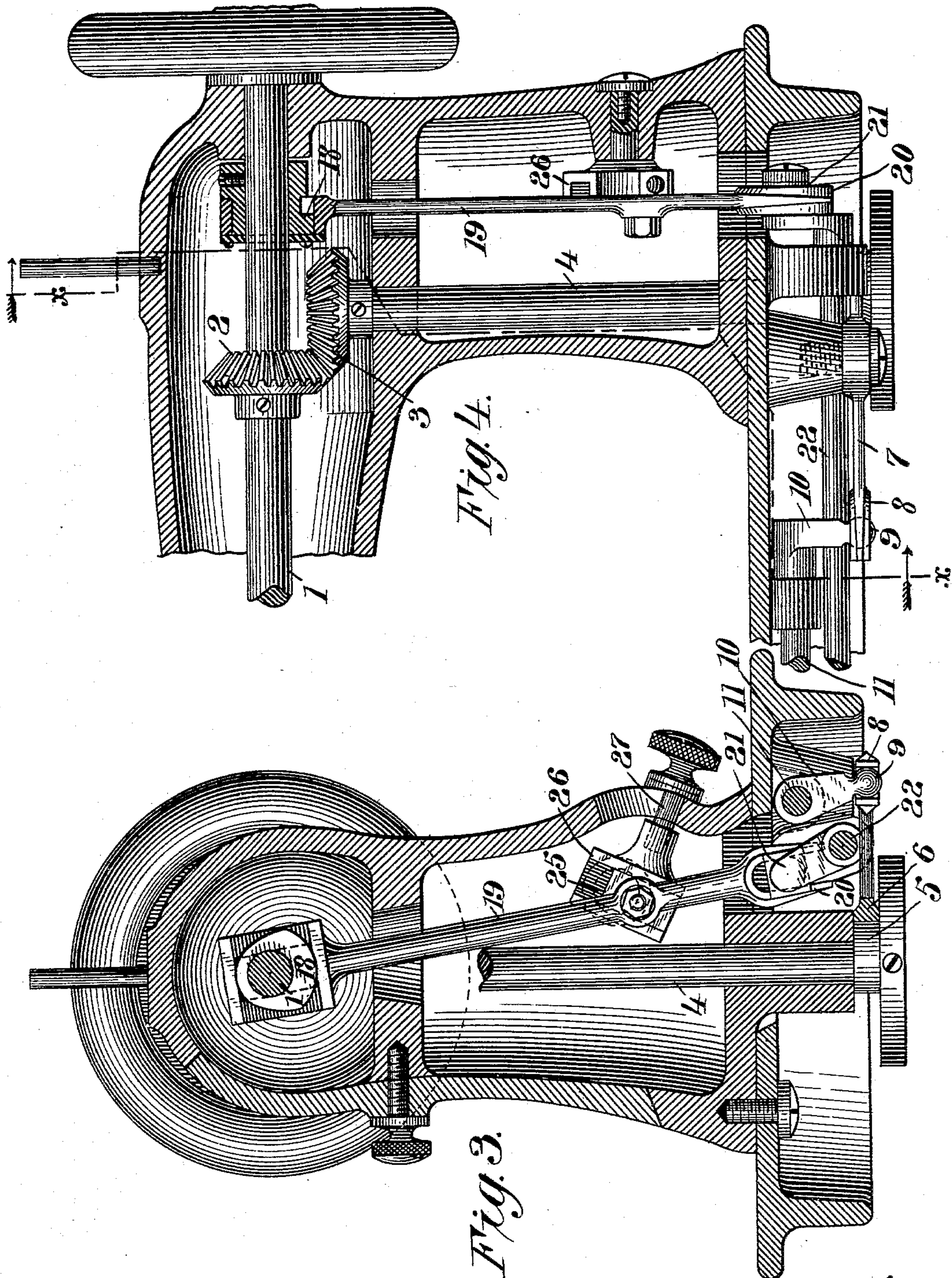
(No Model.)

2 Sheets—Sheet 2.

F. T. LEILICH.
FEEDING MECHANISM FOR SEWING MACHINES.

No. 401,182.

Patented Apr. 9, 1889.



Witnesses
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UNITED STATES PATENT OFFICE.

FRANCIS T. LEILICH, OF BRIDGEPORT, CONNECTICUT.

FEEDING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 401,182, dated April 9, 1889.

Application filed January 25, 1889. Serial No. 297,547. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS T. LEILICH, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Feeding Mechanism for Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in feeding mechanism for sewing-machines, and has for its object to provide such an assemblage of co-operating mechanical elements for the actuation of the goods beneath the needle-bar as shall be simple in construction, positive in all the movements of its operation, and capable of running at high rates of speed; and with these ends in view my invention consists in the construction hereinafter fully and in detail set forth, and then specifically designated by the claims.

In order that those skilled in the art to which my invention appertains may more fully understand its construction, I will now describe the same in detail, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a plan view of those parts of the feeding mechanism which lie beneath the bed-plate, the outline of which latter is shown in dotted lines; Fig. 2, an elevation of the feed-bar and dog; Fig. 3, an irregular transverse vertical section through the arm of a sewing-machine on line *x x* of Fig. 4, showing the feed-driving connection and means for varying the extent of its throw; and Fig. 4, a partial longitudinal vertical section through a sewing-machine arm and bed.

Like reference-numerals denote the same parts in all the figures of the drawings.

1 is the main shaft of the sewing-machine, which is journaled in the arm, and 2 3 are beveled gears whereby a vertical shaft, 4, is caused to rotate synchronously with but at right angles to said main shaft. This vertical shaft serves, through suitable connections, to impart the proper movement to the shuttle, as will be seen by reference to a certain other

application filed by me on the 5th day of May, 1888, for Letters Patent for sewing-machine, said application bearing Serial No. 272,880, and showing a rotary-shuttle sewing-machine in which the feeding mechanism herein described is combined with other parts for use with which it is particularly adapted.

Near the lower end of the vertical shaft 4 is a wiper-cam, 5, secured upon said shaft. This wiper-cam is embraced by a fork, 6, on one end of a bell-crank-lever, 7, which latter is pivoted through its elbow to the bed-plate. (See Fig. 1.) The other end of this bell-crank carries a small fork, 8, which embraces a ball or roller, 9, on the extremity of a rock-arm, 10, which arm depends from a rock-shaft, 11, journaled beneath the bed. The outer extremity of this rock-shaft has a crank-arm, 12, extended outward therefrom substantially parallel to the bed, and a roll or stud, 13, on this arm engages a fork which is formed in the end of the feed-bar 14. (See Figs. 1 and 2.) The other end of the feed-bar is supported upon a pivoted link, 15, so that it may be moved freely to and fro, said link being mounted upon brackets 16, depending from the bed-plate.

The serrated feed-dog 17 is mounted upon the feed-bar with its face in the plane of the bed-plate.

The elements hereinbefore mentioned serve to impart the unvarying vertical reciprocation to the feed-dog, as will be hereinafter more fully set forth.

Upon the main shaft just at the rear of the gears is secured a cam, 18, over which is secured, as by a yoke, the upper end of a connection, 19, whose lower end is forked, as at 20, and embraces the wrist of a crank-arm, 21, projecting outward from a rock-shaft, 22, which latter is hung in bearings beneath the bed. The outer end of this shaft carries a vertically-disposed crank-arm, 23, whose wrist projects through an elongated opening, 24, in the feed-bar, and is adapted to impart to said bar reciprocal movement in the direction of its length.

The connection 19 has pivoted thereto at about one-third its length from the bottom end thereof a slide block or roller, 25, and this slide-block is adapted to slide in a grooved

block, 26, from which a binding-screw, 27, projects outward through the side of the arm. The arm at this point is swelled or bulged to the arc of a circle struck from the center of the slide-block, and is slotted vertically to allow movement to the screw.

It will be readily understood that the wiper-cam on the vertical shaft operating against the fork of the bell-crank will induce in the latter a vibratory movement about its pivotal point, and that this vibratory movement, transmitted through the rock-shaft and its arms, imparts the proper vertical vibratory motion to the feed-bar and dog at each revolution of the machine. The cam on the main shaft likewise imparts to the connection which is yoked over it a reciprocating movement in the direction of its length; but as this connection is secured to the slide-block, and the slide-block is arranged in ways in the grooved block 26, the lower end of the connection acquires a compound movement in proportion as the groove in the block is in line with or at an angle to the length of the connection.

The feed is shown in Fig. 3 as at its greatest throw, because the groove in the block is at its greatest angle to the connection, and the transverse movement of the latter is therefore greatest. The throw of the feed may be modified by moving the screw upward in its slot, so that the line of the groove in the block more nearly approaches the line of the connection. If the screw be moved to its farthest upward limit of movement, then the groove will be in line with the connection and no segmental movement will be imparted to the crank-arm. Such movement as the rock-shaft derives from the connection is in turn transmitted to the feed-bar, so as to carry the same backward and forward, and this movement, combined with the lifting movement which the bar acquires from the other rock-shaft, results in the well-known four-motion feeding movement, best adapted to properly actuate the goods beneath the needle-bar.

I claim—

1. In a feeding mechanism for sewing-machines, the combination, with the feed-bar slotted and forked at one end, as shown, of a link fulcrumed to the bed and upon which the other end of said bar is supported, a horizontally-extended and cranked rock-shaft engaging the forked end of the bar, whereby the appropriate vertical movement is imparted thereto, the feed-driving rock-shaft engaging the slot in the bar, the cam-actuated bell-crank lever, whereby the feed-lifting rock-shaft is actuated, and the vibratory lever connected to the main shaft, whereby the feed-driving shaft is operated, substantially as set forth.

2. In a feeding mechanism for sewing-machines, the combination, with the vertical shaft and the cam secured thereon, of the horizontally-vibrating bell-cranked lever actuated as to one end by said cam, the feed-lifting rock-shaft engaged and actuated by the outer end of said bell-crank lever, the feed-bar operated vertically by said lifting rock-shaft, and means, as described, whereby suitable horizontal reciprocation is imparted to said feed-bar, substantially as and for the purpose specified.

3. In a feeding mechanism for sewing-machines, the combination, with the main shaft and the cam arranged thereon, of the reciprocating connection whose upper end embraces the cam, and whose lower end is forked and engages the wrist of the crank on the feed-driving rock-shaft, a slide-block on the connection, and a grooved block in which the slide-block travels, the slotted arm of the machine, and an adjustable binding device, as a screw, whereby said block may be held in adjusted position, substantially as set forth.

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

FRANCIS T. LEILICH.

Witnesses:

S. H. HUBBARD,

M. C. HINCHCLIFFE.