June 23, 1925. 1,542,865

A. F. FIFIELD

SEWING MACHINE

Filed July 20, 1921 2 Sheets-Sheet 1

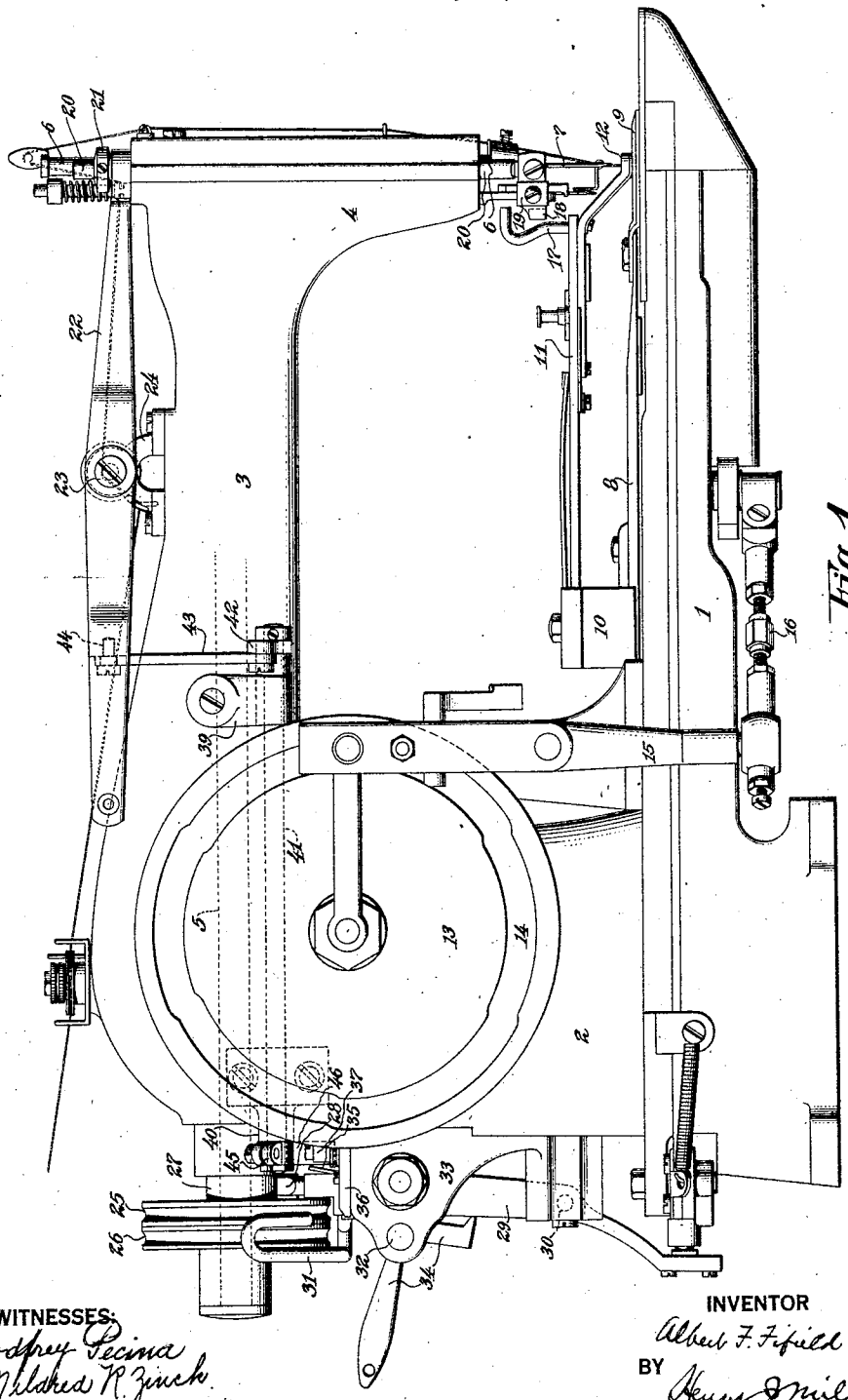


Fig. 1.

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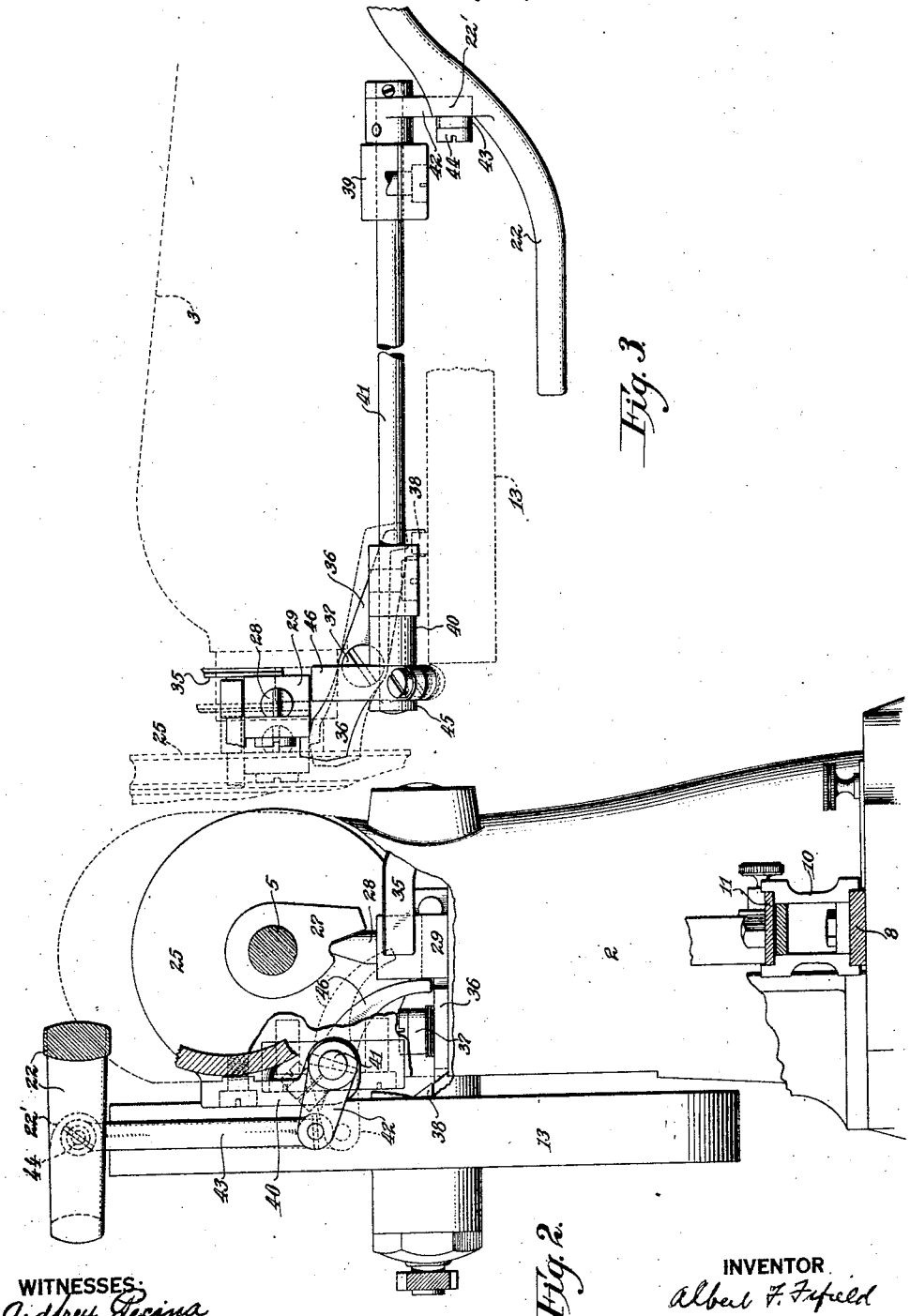


Fig. 2.

Fig. 3

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Patented June 23, 1925. 1,542,865

# UNITED STATES PATENT OFFICE.

ALBERT F. FIFIELD, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, OF ELIZABETH, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## SEWING MACHINE.

Application filed July 20, 1921. Serial No. 486,215.

*To all whom it may concern:*

Be it known that I, ALBERT F. FIFIELD, a citizen of the United States, residing at Newark, in the county of Essex 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.

This invention relates to an improvement in sewing machines provided with stop-motion devices for controlling the operation of the stitch-forming mechanism, and has for its object to provide simple and effective interlocking means whereby the stop-motion may not be operated to start the machine while a work-engaging element is retracted from operative position and whereby the latter may not be operated while the stop-motion is in running position.

While certain features of the present improvement are not confined to association with any particular type of stop-motion, it is especially adapted for employment in connection with that form of stop-motion comprising fixed and loose pulleys with a stopping cam attached to and rotating with the fixed pulley and a swinging controlling lever carrying a belt-shipper and a stopping element in the form of a spring-pressed plunger-bar cooperating with the stopping cam in arresting the stitch-forming mechanism at the end of a cycle of operation of the machine.

In its preferred form, the machine is provided with a presser-lifting lever fulcrumed upon the bracket-arm and with a rock-shaft sustained upon and longitudinally of said bracket-arm and having at one end a crank-arm connected with said lifting lever and at the opposite end a stop-arm normally retracted from but adapted when the lifting lever is operated to swing into the range of movement of the stop-motion controlling lever to obstruct its movement to operative position and consequent shift of the power-belt from the loose to the fast pulley and disengagement of the plunger-bar from the stopping cam. As the stop-arm and stop-motion controlling lever have intersecting paths of movement, and their normal positions are closely adjacent each other, each is effectively locked against operative movement as soon as the other has performed an initial portion of an operative movement, so that neither of the interlocking parts can perform even a partial movement when the other is retracted from initial position.

In the accompanying drawings, Fig. 1 is a rear side elevation of a Singer flat-button sewing machine constructed in substantial accordance with my patent No. 1,226,963 of May 22, 1917, and embodying the present invention. Fig. 2 is a front end elevation of the same with the forward portion of the bracket-arm omitted to expose the parts rearward of the same, certain of which are represented in section. Fig. 3 is a plan of the interlocking parts embodying the present invention, with the sewing machine frame and certain other parts represented in dotted lines.

As represented, the machine is constructed with a frame comprising the cylinder-bed or work-arm 1 from the rear end of which rises the standard 2 from which laterally extends the hollow overhanging arm 3 terminating in the head 4. Journaled within and longitudinally of the arm 3 is the main-shaft 5 from which is derived through usual operative connections the reciprocating movements of the needle-bar 6 carrying the needle 7.

The machine is shown with a well-known form of jogging work-holder comprising the sliding bar 8 carrying at its forward end the work-supporting plate 9, and near its rearward end the block 10 in which is pivoted the spring-depressed arm 11 carrying the upper presser or work-clamping member 12. Jogging movements are imparted to the work-holder by well-known means including the cam 13 having the face-groove 14 adapted to be entered by a roller-stud upon the rock-lever 15 communicating its vibratory movements to the slide-bar 8 through the adjustable link 16 and other suitable connections.

The work-holder arm 11 carries the usual post 17 terminating in a cross-member adapted to engage a lateral member 18 of the block 19 fixed upon the lower end of the lifter-bar 20 having adjacent its upper end the collar 21. Interposed between the collar 21 and the top of the head 4 is the forward end of the controlling lifting lever 22 mounted by means of the fulcrum-pin 23 upon the bracket 24 secured upon the bracket-arm 3.

The stop-motion mechanism of the present

machine is substantially the same as that of the United States patent to W. L. Barron No. 1,093,241 of April 14, 1914. Upon the rearward end portion of the main-shaft 5 are mounted the usual fixed and loose pulleys 25 and 26. The stopping cam 27 is also mounted upon and adapted to rotate with said shaft. Cooperating with the stopping cam 27 is the plunger-bar 28 slidingly mounted within the swinging stop-lever 29 fulcrumed at 30 upon a bracket of the standard 2. The lever 29 carries the belt-shipper arm 31. Mounted upon the pivotal pin 32 of the bracket 33 is the angular shift-lever 34 for tilting the stop-lever 29 in opposition to its spring 35 to shift the driving belt from the loose to the tight pulley and disengage the plunger-bar 28 from the stopping cam 27.

The stop-lever is detained in running position by means of the catch-lever 36 mounted upon the frame by means of the fulcrum screw-stud 37 and adapted to be tripped for disengagement of the stop-lever by means of the tripping stud 38 carried upon the inner face of the cam-wheel 13.

Mounted in bearings 39 and 40, secured respectively to the bracket-arm 3 and standard 2, is the rock-shaft 41 extending lengthwise of the arm 3 and parallel with the main-shaft 5. Fixed upon the forward end of the rock-shaft 41 is the crank-arm 42 pivotally connected to the lower end of the link 43 whose apertured upper end embraces the screw-stud 44 tapped into a lateral boss 22′ of the lifting lever 22.

Secured upon the opposite end of the rock-shaft 41 is the split hub 45 of a stop-arm 46 extending downwardly and inwardly into close proximity with the stop-lever 29 and slightly to one side of the stop-lever when in stopping position, as represented in the drawings. The swinging stop-lever 29 and stop-arm 46 are so mounted that each is movable into the range of movement of the other, so that when one is moved from normal retracted position the other is locked against corresponding movement.

The machine being at rest, the operator lifts the upper work-clamping member or work-presser 12 to admit the work by tilting the lifting lever 22 through the usual treadle connection, thereby rocking the shaft 41 and shifting the stop-arm 46 into the dotted line position represented in Fig. 2, thus obstructing the starting movement of the stop-lever 29 and the premature starting of a stitching operation. The work having been inserted and the presser lowered, the stop-arm 46 is returned to its initial full line position of Fig. 2, and the stop-lever 29 is thereafter free to be shifted forwardly to start the main-shaft and the stitch-forming mechanism, as represented in full lines in Fig. 3. In this position of the parts the operative movement of the stop-arm 46 is obstructed by the stop-lever 29, thereby preventing the actuation of the lifting lever 22 and raising of the work-presser 22 to open the work-holder prematurely. It will thus be seen that the initial raising of the work-presser will insure against premature starting of the stitching mechanism, while the shift of the stop-lever to start the stitch-forming mechanism in operation will insure against the inopportune opening of the work-holder, the interlocking means accomplishing this result according to the present improvement having direct and positive connections with the parts which they thus control.

The employment of a rock-shaft carrying the stop-arm and operatively connected with the lifting mechanism affords a simple and effective interlocking means for the purpose described, while the location of the rock-shaft upon the bracket-arm insures compactness and neatness of appearance.

While the stop-lever 29 and stop-arm 46, in the present embodiment, vibrate or reciprocate in curved paths about their respective fulcra, it is evident that in certain aspects of the present improvement the nature of their reciprocatory movements is not material.

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

1. In a sewing machine, in combination, stitch-forming mechanism, a main-shaft, tight and loose belt-pulleys on said main-shaft, a manually operated belt-shipper lever, a work-clamp, a manually operated clamp-opening lever, a rock-shaft parallel to said main-shaft and connected to said clamp-opening lever, and a stop-arm on said rock-shaft arranged to move into the path of and block movement of said belt-shipper lever to running position when the work-clamp is open.

2. In a sewing machine, in combination, a stop-motion comprising a control lever manually shiftable to starting position to effect connection of the machine with a source of power, a work-clamp, manually operated means for opening the work-clamp, and a stop-arm connected to said manually operated means and pivotally mounted to swing on an axis parallel to the plane of manual movement of said stop-motion control lever, said stop-arm being arranged to move into the path of and block movement of said stop-motion control lever to starting position when the work-clamp is open.

3. A sewing machine having a frame including a bed and overhanging bracket-arm, stitch-forming mechanism incorporated in said frame, a work-clamp, a manually operated lever fulcrumed on said bracket-arm and connected to open said work-clamp, a stop-motion device for the stitch-forming mechanism including a belt-shipper lever

manually shiftable to starting position to effect connection of the machine to a source of power, a rock-shaft journaled on said bracket-arm and having its opposite ends disposed respectively, adjacent the clamp-opening and belt-shipper levers, means connected to the clamp-opening lever for rocking said shaft, and a stop-arm mounted on said shaft so as to move into the path of and block movement of the belt-shipper lever to running position when the work-clamp is open.

In testimony whereof, I have signed my name to this specification.

ALBERT F. FIFIELD.